The Builder.

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ILLUSTRATIONS.

Britannia Royal Naval College, Dartmouth.—Mr. Aston Webb, A.R.A., architect ..... *Extra Large-Page Photo-Litho.*
Thaxted Parish Church, Essex.—Measured and drawn by Mr. C. Wontner Smith ..... *Three Double-Page Photo-Lithos.*

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Architecture at the Royal Academy.

We do not think the present year's exhibition at the architectural room of the Royal Academy will count as one of the best, though there are some good drawings among the number. The room is also enlivened by the presence of four architectural models, two of which are of considerable interest. As these are the most prominent objects in the room, and form a separate class, and as moreover a model comes closer, in a sense, to the actual architecture than a drawing, we may mention the models first.

The most important is that for the upper part of the tower for Colchester Town Hall, designed by Mr. John Belcher. As this is obviously not a "personally conducted" model, we may suggest that in such case the modeller's name might be given. The architect's detail drawing for this tower, exhibited at the last Academy, was published in the *Builder* for December 24, 1898. The model does not differ in any way from the design as shown in the drawing, but it exhibits more effectively the graceful contrast of the lower and upper stages, the upper planned on a concave line on each face, with four colonnettes, two recessed, at each angle. The clock face, a metal construction inserted on the plain face of the tower below, is effective; the figures are replaced by the signs of the zodiac; a fanciful substitution of which we fail to see the point, unless the sun traversed the signs in an hour instead of a year.

The other plan of special interest is Mr. Prior's small house, planned in diagonal cross form—diagonal, that is, to the main lines of the garden surroundings. A plan is given, showing the dining-room (S.E.), the drawing-room (S.W.), the study (N.W.), and the kitchen (N.E.) forming the four arms of the cross. There seem to be four entrances, one in each angle of the cross, the front door to the north and the principal garden door, with a flight of curved steps, to the south, between the dining-room and drawing-room; a kitchen garden walk runs away on the axial line to the east, and a flower garden walk to the west. The centre of the block is occupied by an open court about 15 ft. square, which gives, through semi-circular windows, light and air to the passages which connect the rooms. The design of the house is of an apparently intentionally naïve kind—what might be called farm-house Gothic, and the eight tall chimneys, battered in line, standing up at different points, remind one of the towers of San Gemignano. But it is a matter of interest to see a house which is so completely individual and unlike ordinary houses; and moreover we may add that the idea of the plan might be worked out just as well, and perhaps with a good deal more effect, in a more sophisticated (as Mr. Prior would perhaps call it) form of architecture. Of the other models, a small one of a gate house to be erected at the entrance of the Petersham Avenue leading to Ham House, is perhaps of interest chiefly on account of its intended site. Mr. C. T. Blomfield's larger model of a house at Poulton, Fairford, shows a plain house of the mullioned type with broad bays segmental on plan, marking the dining-room and library, with the drawing-room intervening between them; but in this case no compass point is given, so that one can form no idea of the aspect. It is surprising how many architects overlook this necessary piece of information on a plan. The general treatment of the house is broad and simple, but why mimic in a model the moss and green stains supposed to have accumulated on the roof? We presume it is a model of a new house, not of an old one.

Coming to the drawings, the most important one, occupying the central position on the end wall, is that of which we give a reproduction in the present issue; the dignified and grandiose design for the Britannia Royal Naval College at Dartmouth (1,671), by Mr. Aston Webb, the last elected Associate of the Royal Academy. The main portion, as will be seen by the drawing, is an entirely symmetrical block; the end wings are slightly different, owing to the requirements of the plan, but treated so as not to interfere with the generally grandiose aspect of the whole; the two towers, similarly treated, serve to keep the balance; they appear rather different in proportion in the drawing, but this is obviously the fault of the draughtsman; the design of both is identical. The manner in which the wings of the main building are connected with and yet separated from the centre block by carrying on the cornice on an open colonnade, is a pretty feature in the design. The laying out of the approaches is very dignified, and worthy of the fine position of the building as shown in the sketch of the general site, which we have added in the margin of the principal view. A small plan is appended to the view, on a sufficiently large scale, the author thus setting an example which others of the Academician architects unfortunately do not set, of explaining his view by a plan. The plan which we give is from a larger tracing, kindly prepared for us by the architect.

At the opposite end of the room is the contribution of another Academician, Mr. Jackson; a perspective view of the new Radcliffe Library at Oxford (1,830). No plan is given. In regard to style the building, which, but for the arrangement of the windows, rather suggests a college chapel, is an interesting experiment in combining Classic detail with the general features of a late Gothic buttressed building. The terminations of the buttresses are treated with Classic gablets and mouldings, but the general feeling is Gothic. Between the buttresses three tiers of mullioned windows, with square or segmental heads, are grouped beneath a round-headed arch. The point we do not like is the columns on the upper half of the end, projecting from the building and stopped short upon corbels. Why architects do things of this kind is beyond our comprehension. Of course the *genius loci* may be quoted, but it seems rather a confession of weakness on the part of modern architecture to have recourse to the imitation of a clumsy feature of late Renaissance to fill up the end of a building.

The other Academician architects who exhibit are Mr. Waterhouse, Professor Aitchison, and Mr. Bodley. Mr. Waterhouse's contribution is a view of the extensive additions to the Prudential Assurance Company's offices in Holborn (1,853: no plan). The drawing shows a massive square centre tower or pavilion added to eastward of the present building, forming the centre of the composition, which is completed by the additional building eastward of it, balancing the existing building on the other side. The

central mass terminates in a high roof rising behind a battlemented finish, and with conical-roofed turrets corbelled out at the angles, and connected by a deep corbel-table with a row of small windows above; this feature aids much in giving force to the centre block. The style of the rest is in keeping with the existing building, which is familiar to every Londoner. Professor Aitchison sends his diploma drawing, a geometrical elevation of the Royal Exchange Assurance Offices in Pall Mall (1,608), a street elevation of singularly refined character, of which we published an illustration at the time it was completed. Small plans of two floors are added. Mr. Bodley exhibits an interior of St. John's Church, Cowley Oxford (1,625), a drawing which carries us back to the days of the Gothic revival.

A large drawing of the scheme for the decoration of the Lady Chapel, Holy Trinity Church Chelsea (1,743) is exhibited under the name of Mr. H. Wilson, though the inscription on the border gives the name of Mr. C. W. Whall also, as collaborator. This is one of those drawings, for the preparation of which Mr. Wilson has a special genius, which are most striking as specimens of colour effect, but which in general too much want definite architectural quality, and which impress us with the idea that they represent an imaginary effect which the actual building will not realise. Two of the piers in the chapel present in the drawing a picturesque mass of detail of which we cannot tell whether it is carving, or material laid on, or what, though the general effect is highly picturesque; all one can be positive about is that the author of the drawing is a master of effect in water-colour.

One of the most interesting exhibits is the frame of four drawings exhibited by Mr. Caröe, showing the archiepiscopal palace at Canterbury (1,645). From the rambling character of the small plan given, and its want of perpendicularity, we gather that this is partly a working up of old buildings, or at all events that the lines of the building have been determined by the positions of some existing walls. The plan is a long irregular range of rooms with a return backward at one end and a projection at an oblique angle in the centre; this latter contains the dining-room, and probably the drawing-room, which does not appear on the ground plan, is over it. The entrance porch and vestibule are at the re-entering angle of this projection with the main block. The illustrations comprise a general bird's-eye view, a small view of one end of the building as seen from the cloister wall, a general view from the south-west showing how the buildings group with the cathedral, and a view of the return end, the upper portion of which, with its large mullioned window, we take to be the chapel. It is an exceedingly picturesque group of buildings, of which we will give illustrations in our next issue, when we hope the architect will be kind enough to furnish us with some further description, which seems necessary to the proper understanding of the building. This is another case in which a plan on a larger scale would have been very useful to enable the spectator to understand the working out of the design.

Among public buildings illustrated is a large and finely-executed line drawing of "Entrance to the Assize Courts, New Law Courts, Cardiff" (1,646), by Messrs. Lanchester, Stewart, & Rickards. This is a solid and weighty piece of architectural design, with a colonnade in the centre portion, contrasted by plain square masses at each side. The centre bay of the colonnade is broken by the projection of the porch thrust out from it; a rather curious bit of design, in which the side piers, with the succession of large mouldings built on over each other at top, have almost the effect of reminding one of Hindu architecture; the seated figures on the top are effectively placed. One of the great merits of the design for this building, taken as a whole, consists in the picturesque and effective manner in which the authors have used the device of rustication, introducing it in such a manner as to be a far more genuine source of expression than it generally is. Mr. Mountford exhibits exterior and interior perspectives of his design for the new States Hall for Guernsey; no plan is given, which is the more to be regretted, as we know that the plan is a particularly good one. The exterior view (1,769) shows a classic building of very solid and massive character, the walls treated entirely in rustication. In the centre projects a pedimented portico with coupled columns at each side, between which is a semi-circular recess with a coffered semi-dome; at the back of this is placed the entrance doorway. Above the portico is a tower formed of a high stage of perfectly plain rusticated masonry, supporting a story with a cornice in concave lines on the principal faces, in which the device of the portico, an "apse" with a rectangular entry at the back, is echoed on a smaller scale; above this is a small columned cupola on circular lines, contrasting gracefully with those of the story below it. The rest of the building is kept low and square in its lines, the flanks being emphasised at each end by pedimented projections with an order of columns and pilasters. The windows at the side repeat those in front, and the cornice is carried all round, only intercepted by the entrance portico; there is a simple unity about the design which is very pleasing. The interior shows the "Salle d'attente," (1,728), a wide and spacious corridor divided into bays by semi-circular arches with coffered soffits, repeated on the walls, and each compartment surmounted by a coffered dome. The wide piers are decorated with a pilaster at each side, between which, on the lower part of the pier, a pedimented niche is introduced. The floor has a simple decorative treatment of bands and circles in darker stone than the rest; the whole effect is quiet and dignified. A competition design for the same building (1,710) is exhibited by Mr. Frank Atkinson, an exterior perspective (no plan) which has a good general effect, though weak in some points; the tower breaks awkwardly from the sloping roof, its two upper stories are not sufficiently contrasted, and the series of windows at the side are too disconnected and deficient in grouping. Mr. Bramwell Thomas exhibits a large perspective of the new City Hall, Belfast (1,785: no plan), a grandiose building in general effect, but compiled out of very ordinary materials; a piece of architectural commonplace.

Among other important drawings Mr. Belcher exhibits a finely-executed detail elevation of part of his Colchester Town Hall façade (1,722), with coupled stone columns carrying alternately angular and segmental pediments, on a *fond* of red brick; two tiers of windows are included under the pediments, above a rusticated basement. The capitals of the order appear to be what might be described as "Composite" with the scrolls inverted, which we merely note as a fact, not as implying reprobation. The same architect exhibits a large line drawing of the interior of the staircase for the Guildhall, Cambridge, (1,869) which again requires a plan to properly explain it. The view is taken from the upper part of the main flight of stairs, looking down into the hall. The stairs are included in a rusticated basement, above which is a pilaster order with a sculptured frieze running round the upper part of the wall, interrupted by the pilasters; between them are arches on a smaller order opening into a loggia on the first floor level. It is not clear from the drawing, however, whether this is a double staircase hall, the stair repeated beyond the archway on the other side, or not; a point which a small plan would have made clear.

Among the special features of the exhibition may be mentioned the designs for small bridges by Mr. Ernest George; "Two Wooden Bridges" (1,635), and "Bridge, Lodge, and Gate, North Mymms" (1,749). The latter is a simply-treated stone bridge with the old-fashioned cut-water plan to the centre pier in the middle of the stream, carrying a triangular recess corbelled-out over it; the entry to the bridge at each end is marked by a semi-octagon bay spreading from the roadway and terminated by small obelisks on pedestals which form a "stop" to the walls; the lodge, in two stories, is also octagonal, with a central cluster of flues, and groups very well with the bridge. The wooden bridges are two very simple erections; one a covered bridge at Monk-Fryston Park, Hants, the other a small foot-bridge over a right of way, terminated by an octagonal staircase turret of access, the other end of the bridge resting on the top of a sloping bank. This drawing shows how picturesque effect may be given to a small and simple structure for a practical purpose.

Among the more important drawings, to which we are present confining our remarks, may be mentioned two decorative drawings, in very similar style and looking as if they came out of the same "school," at all events. One is Mr. Belcher's "Diagram of Decoration in Council Chamber, Colchester Town Hall" (1,831), which is not exactly a diagram, but a large perspective sketch of the room, with indications of the position and nature of the decoration. This consists of figures in decorative cartouches on the wall spaces between the openings or Welsh vaults at the sides of the ceiling, and scattered bits of colour design of scrolls, &c., of Renaissance type; while in the flat centre compartment is a ring of figures apparently dancing round in a circle, with their heads toward the centre. The general effect of the decoration is very bright and festive; the objection always exists, however, to painting figures on the flat of a ceiling, that it creates a confusion as to which way up one is to regard them, though the complete circle is certainly better than separate standing figures in panels. The other drawing we referred to is Mr. R. S. Balfour's "Branksee Castle, Dorsetshire, interior of south hall" (1,698). The hall is a large apartment divided into two by an arcade of three arches, carried on piers formed each by four columns on one pedestal and carrying one block of architrave; the

ceiling of the nearer room is a cross vault with no ribs, only meeting edges, returned on itself in the centre as a pendant from which hangs a lantern; it is decorated, in a similar manner to Mr. Belcher's Guildhall Room, by figures and other devices painted here and there on the ceiling, but not connected into any main design. The drawing is a very good one, and the general effect good, but there is an unconstructive look about the pendant in the centre; the vault appears to be a plastered one, and one would like to know what the construction really is, of which there is no indication.

We shall have more to say about other drawings in the collection.

ART IN THE HOUSE OF LORDS.

THE debate in the House of Lords on Friday last week, in reference to the decoration of St. Paul's, was amusing in more senses than one. Lord Wemyss, who led the attack, adopted the attitude of superior instructor in matters of taste to the House of Lords, which in former days, as Lord Elcho, he used to assume for the benefit of her Majesty's faithful Commons. He pointed out to the Peers that St. Paul's was "perfect and ideal in proportion and in all that was required in buildings of that kind," a sweeping assertion which would apply to the Parthenon and to a very few other buildings of the world, but not to St. Paul's, a great of the detail of which is by no means in a good or pure style. People whose knowledge in architecture is limited should not make such extensive assertions. If he had confined himself to saying that the decorations were not in keeping with the character of the building he would have been safe. Lord Wemyss also quoted at length from what he described as "a letter that had been addressed to a London paper," which was really the clever and witty imaginary letter about the doings of "Commendatore Richmond" supposed to be addressed to *Punch* by the ghost of Michelangelo. Whether Lord Wemyss really did not know what it was, or whether he thought the authority of *Punch* would be insufficient for the House of Lords, does not appear.

Lord Wemyss's ostensible object was "to ask her Majesty's Government if they can by any means put a stop to the decorative destruction of St. Paul's that is now going on apace under the orders of the Dean and a Committee of Taste; and whether, if this is beyond their power, they will take such legislative action as will save our other cathedrals from the possibilities of a like evil fate." The reply of Lord Salisbury was as amusing in its way as Lord Wemyss's heroics. Lord Salisbury is a typical representative of the national English character, both in its strong points and its intellectual restrictions. One of the latter is the entire inability, on the part of the average Englishman, and more emphatically the average English statesman, to understand that a question of art can be a matter for serious consideration. The whole tone of Lord Salisbury's reply proceeded on the assumption that the question of the decoration of St. Paul's was a kind of joke, a subject which it was impossible to expect that any sensible statesman would take seriously. That is the usual attitude of Parliament and of corporate bodies towards art in this country; and until they learn that art is a matter of serious intellectual interest there will be little chance for public and national art in this country.

Even better than Lord Salisbury's masterly indifference was the ignorance or prejudice on the whole subject betrayed by Lord Clifden, who interposed in the debate to say that if their lordships had not seen "these very disagreeable mosaics," he hoped they would look at the mosaic recently unveiled in the Central Hall of the Houses of Parliament, "in which they might see a specimen of the sort of work which was being done at St. Paul's." Now the very point of the objectors to the work at St. Paul's is that it is *not* the same sort of mosaic as that carried out under Sir E. Poynter, but the adoption of an ancient system of mosaic of Byzantine type, which does not harmonise with St. Paul's. The mosaics in the Hall of the Houses of Parliament would, as far as style of execution goes, harmonise well enough with St. Paul's. The most charming point of all is that here we have another addition to the decoration of the Houses of Parliament, carried out by the President of the Royal Academy, and the only use Lord Clifden can make of it is to invite members to look at it to see what a wretched thing mosaic is! Really, members of the Legislature, Peers and Commons alike, ought to be made to pass an examination before they are allowed to speak about art in public.

As to the question of Government interference, of course every one knew that the Government cannot interfere with the Dean of a cathedral in the treatment of his building. Whether it is desirable that an Act should be passed to put the cathedrals under State supervision is very questionable. The example of the French "Commission des Monuments Historiques" is not reassuring. Deans have sometimes done foolish things with the buildings in their charge, but we should say that to transfer the cathedrals to State supervision would be to put them out of the frying-pan into the fire.

We cannot help remarking on the singular manner in which, in England, questions of this kind as to the treatment of a building are never raised till after the work is done. Any one with his eyes open might have seen, when the first bay of St. Paul's choir was finished, that the work was in a style differing from Renaissance work; and moveover, that if so much colour were put in the roof the difficulty must arise as to knowing where to stop, and as to the necessity for adding some colour in the substructure to support that in the roof. But no one ever sees or protests about anything of this kind till it is all done—and then a storm is got up when it is too late to be of much use.

We desire to repeat our proposal, already made, that the decoration should be confined to the ritual portion of the church, the choir and dome, leaving the transepts and nave as Wren left them. The special decoration of the ritual portion of a church is a perfectly logical procedure; and as matters have been carried thus far, we think the dome ought to be included; but it must be very carefully handled, and we ought to know exactly what is to be done with it before any more money is subscribed.

NOTES.

The Secret Commission Bill. THE Bill which Lord Russell of Killowen has introduced into the House of Lords for the purpose of putting an end to the practice of taking secret commissions may, if it becomes law, have some moral effect in checking this pernicious custom, but we scarcely expect it to have any direct results. The difficulty of instituting prosecutions, of obtaining evidence, the disclosure of trade secrets, will militate against its action as a criminal weapon. There must at the present time be many cases in which employers could recover from their agents secret commissions which they have received if they would take the trouble to institute legal proceedings. If employers will not do this, when they might recover money received by agents, is it likely they will prosecute their servants? As regards the Parliamentary fate of the Bill, it cannot be regarded as certain to become law during the present Session. It will pass the House of Lords; it will probably be discussed in a debate in the House of Commons, but unless the Government take it up, which is not likely, the probabilities are that it will not get through the Lower House. But in any event the continued attraction of public attention to this subject must do good.

The London Gas Inquiry. THE House of Commons Committee appointed to make inquiries respecting the prices charged for gas by the Metropolitan companies have commenced their labours; and now is the time for Vestries, District Boards, and others who have, or believe they have, reason to complain of the conduct of any of the three Metropolitan gas companies in the matter under consideration, to make known their grievances. Sir Courtenay Boyle, the Permanent Secretary of the Board of Trade, has already given evidence, but nothing of particular interest transpired at his examination. It appears that the prices of gas in the year 1889 compare with those of to-day as follows:—

	1889. s. d.	1899. s. d.
Gas Light and Coke Co. (North of Thames)	2 6	3 0
South Metropolitan Gas Co.	2 3	2 2
Commercial Gas Co.	2 4	2 6

Beyond the fact that the Gas Light and Coke Company have abolished meter rents, we have no information, apart from capitalisation considerations, that will greatly aid in accounting for the 38 per cent. excess charge of this company over that of the South Metropolitan Company. The charge of faulty management is a serious one for consumers, shareholders, and officials alike, and can only be dealt with satisfactorily by an impartial committee, such as that now sitting, after exhaustive inquiry. The gas companies have expressed their willingness to give all possible assistance in the inquiry, and it is to be hoped that in future more friendly relations will exist between the controlling authorities and the gas companies. Cheap gas of a predetermined heating value is the only practicable "smokeless" fuel that London is likely to possess for some years to come, and those citizens who are anxious to live in a brighter and clearer atmosphere would do well to see that no petty strife between company and local authority, and no mismanagement of huge business concerns, is allowed to interfere with the supply

of gas of a standard quality at the cheapest possible rate.

Technical Education.

THE recent Report showing the amount expended in England on technical education during the last financial year is again worthy of notice. The total amount expended was 12,000*l.*, which is exclusive of the sums allocated to intermediate and technical education under the Welsh Intermediate Education Act, 1889. As we have more than once had occasion to point out, the weak part of the present system, or want of system, is that money appears to be frittered away in large quantities over bits of technical education in rural districts. The instruction and the course is too often more regarded as a pastimè than as a serious business, and there is also a want of continuity. It is very little use for a young man to attend carpentering classes for a few evenings during the winter months if he does not go on with the work after that season is over. There is also too much inclination on the part of the Local Authorities to give every village and hamlet a bit of the grant, whereas the money would often be more fruitful if the instruction were more centralised and the courses more continuous and longer.

Old Age Pensions Again.

THERE is something comical in the way in which measures are discussed in Parliament, and then turned over to a Select Committee or a Royal Commission, as, at any rate, a temporary means of getting rid of them. The last example of this is the Old Age Pensions Bill, which was this week referred to a Select Committee. During the last few years any amount of information has been elicited on this subject. It will now again undergo the same process. The truth is that Members of Parliament are in a dilemma. They see no satisfactory way of helping the aged poor without increasing pauperism; but pledges given at the last General Election, and fears of that which is approaching, make them anxious to place some measure on the Statute Book which will please the electorate. There never was a time when the ordinary Member of Parliament was more timeserving than at present. Without a grasp of principles, with good intentions, he is the very man to fill the Statute Book with unworkable nonsense.

The "Benndorf" Monographs.

THE "Festschrift" offered to Dr. Otto Benndorf on his sixtieth birthday contains a number of articles of great archæological importance. Out of the fifty-three contributions we may set aside those of purely literary interest, and note only the weightiest of those that remain. Homeric antiquities are represented by an article by A. Engelbricht on burial customs in Homeric days, and another by J. Jüthner on the Homeric discus. Under this head, too, comes a discussion by M. Hoernes on Greek and West-European weapons of the Bronze period. Among the many monographs on vases one by Dr. Pernice on a Corinthian *pinax* or tablet calls for special notice. He discusses an unpublished fragment (in the Berlin *Antiquarium*) decorated with a most curious and interesting design. A potter's oven is depicted surmounted by a large owl—presumably to indicate Athene. In front of the oven is the figure of a tiny gnome, at which a man—presumably the potter — is gazing with attention. Literature gives the clue to the meaning. Pollux (vii., 108) tells us that it was the custom to set up in front of ovens in craftsmen's shops grotesque figures to avert ill-luck. They were called *βασκάνια*. Moreover, the pre-Homeric poem on "Potters and the Potter's Oven" mentions by name a number of evil sprites whose business it was, if angered, to break and crack the pottery. It was no doubt to keep such evil spirits off that the little figure on the *pinax* was set up. Among the many articles on sculpture we have only space to note the publication of a charming bronze in the possession of the Earl of Elgin, at Broomhall, Dunfermline. It represents Athene holding an owl, and is discussed by Dr. Conze, of Berlin.

Cement Testing.

A REPORT is given in the *Engineering Record* of February 24, 1899, of a paper read by Mr. R. W. Lesley, Assoc.Am.Soc.C.E., on "Cement Specifications and Cement Testing." He points out that the testing of cement is being carried out more and more systematically, but that in spite of this the results vary in a very striking way. The breaking strength of cement briquettes varies very much with the circumstances under which it is made and tested, and also with the individual who makes the test, so that it is possible to get very different results from the same cement. The strength of the briquette may thus be affected by the porosity or otherwise of the slab on which it is made, by the cleanliness of the mould, or by the presence of air bubbles if the mould has not been carefully tapped or shaken. The speed of loading, too, is liable to affect the ultimate strength, besides, of course, the amount of water used in gauging and the time allowed between the setting and testing of the briquette. He strongly urges the importance of having a preliminary test of cement to be used on a large piece of work carried out by a trained expert in a properly-equipped laboratory, in addition to the continuous tests which must be run as the work proceeds. The tests carried out by the expert would then form a standard in case of any difficulty arising between the manufacturer and the engineer on the works.

The Smoke Nuisance.

FROM the March number of the Journal of the Franklin Institute we learn that serious efforts are being made to obviate the smoke nuisance in Philadelphia. As a result of several meetings* of that Institute, held specially to consider the question, a proposed ordinance has been drawn up by the Committee of Science and the Arts of the Institute, and recommended to the Board of Health of the city for adoption. The special object of this ordinance is to prohibit the frequent emission of opaque smoke from chimneys of boiler furnaces and smoke-stacks of locomotive engines. It defines "frequent emission" as being the discharge of heavy black smoke for a period of three minutes in any one hour, and repeated in subsequent hours, so as to become a public nuisance. It is proposed to make this liable to a penalty of 2*l.* for the first offence, 5*l.* for the second, and 10*l.* for every subsequent offence.

* See the *Journal* of the Franklin Institute, June and July, 1897; and January and February, 1898.

Brick Street-Paving.

IT is somewhat surprising that bricks have been so little used for the paving of the carriage-ways of streets in this country. In the United States they have been adopted with satisfactory results, and many miles of streets in Holland are paved with bricks, including the road from Utrecht to Conningham, twenty-seven miles in length. Whether the new brick introduced by Messrs. Woolliscroft, of Hanley, will lead to the adoption of brick paving for English streets we cannot say; but, at any rate, the material is worthy of trial. The brick has been tested by Mr. J. T. Eayrs, M.Inst.C.E., and it compares very favourably with American paving-bricks. The abrasion test was carried out by placing five bricks in a tumbler or rattler, 24 in. in diameter and 30 in. long, and giving them 1,000 revolutions at a speed of twenty-five per minute. The average loss amounted to 7·15 per cent. The test for absorption showed that the bricks are very dense, as the average gain per cent., after fifty-three hours' immersion, was only 1·57 per cent. The makers recommend that the bricks should be laid on a cushion of sand, 1 in. to 1½ in. thick, and then rolled and jointed with bituminous or Portland cement grout, the former being preferred on account of its greater elasticity, and because it "materially reduces the noise of traffic and absorbs vibration." In the estimate of cost of this paving no account is taken of the concrete foundation, which will certainly be necessary if the paving is to be at all satisfactory. This foundation is sometimes of gravel, but in America Portland cement concrete is now generally used. The bricks, we may add, measure 9 in. by 4½ in. by 2⅜ in., and all the arrises are rounded to a ¼ in. radius to prevent chipping. The average weight of the bricks is about 8 lbs. 5¾ ozs., or about 136 lbs. per cubic foot. As the makers offer to "lay a street or portion of one" as a test, we trust that it will not be long before a trial is made; there seems every reason to believe that brick paving will be less noisy than granite, less absorbent than wood, and less slippery than asphalt, but it remains to be seen whether it will combine, to any satisfactory degree, the best qualities of these three materials.

Advertising in Edinburgh.

A BILL which has been promoted by the Edinburgh Corporation, and which has been under the consideration of a Select Committee of the House of Commons, contains among its provisions some clauses to enable the Edinburgh Corporation to take decisive action against disfigurement of the city by advertisements. No advertisements, except those (not illuminated) which may be exhibited within the window of a building or within a public conveyance or in a railway station, are to be put up without a licence from the Edinburgh magistrates. The Committee, as reported in the *Times*, has ruled (very foolishly in our opinion) that the Edinburgh Corporation might have powers in respect of the control of sites and hoardings to be used for advertising purposes, but no power of censorship over advertisements would be conferred. This will frustrate the real object of the Bill, which is, as the counsel of the Edinburgh Corporation put it, "to prevent the disfigurement of their beautiful city by advertisements." It is a most laudable

and sensible object, and the Committee ought to have given it every support. We regret that any Parliamentary cold water should have been thrown on such a scheme, the proposal of which is highly creditable to the Edinburgh municipal authorities.

Winchester Castle and the Moat.

ADVERTING to our "Note" of April 15 (page 363 *ante*) we may here mention that of late years the older defensive works of the castle have been considerably obliterated in the making of the railway and of a parade-ground for the garrison, including nearly all of the space between Southgate-street and the barracks; the ditch followed the course of the old city wall, and the site of the castle hall, which narrowly escaped from the fire at the infantry barracks in December, 1894, was in the outer bailey, or sheriff's ward. The castle, ascribed to William the Conqueror, stood at the south-west angle of the city wall, against which abuts one end of its chapel, so-called, of St. Stephen, which afterwards was converted into the County Hall. The castle, whereof William of Wykeham was constable for a time, was granted, with its precincts, to Sir John de Tichborne by James I., and eventually passed to the Corporation, who sold it for five shillings to Charles II. by a deed dated March 17, 1682. Having served during the reigns of George I. and his two successors as a prison for captives taken in war, it was ultimately converted into barracks in 1796. On March 23, 1683, was laid the first stone of the King's house or palace, never completed, which Wren designed to include a grand approach to the west front of the cathedral.* In Milner's "Winchester," 1798–1801, is a large plate "*ex autographo C. Wren equit.*" giving a conspectus of the proposed buildings. Milner says the view is from a drawing by Wren, yet some doubt exists as to its authenticity. Of the castle hall, supposed to be *temp.* Henry III., an account, by Smirke, will be found in the Winchester volume of the Archæological Institute. George I. gave to the Duke of Bolton (who set them in his house at Hackwood Park, near Basingstoke) the marble pillars which the Grand Duke of Tuscany had presented for the grand staircase in the King's palace. Three of the four city gates were demolished by the commissioners appointed in 1770.

Kew Gardens.

THERE have just been opened to the public the grounds (about 15 acres) belonging to the "Queen's Cottage," which hitherto have afforded an undisturbed resort for rabbits, squirrels, and squirrel-like dormice, together with a variety of wild birds, whereof some fifty-five species made the beautiful bit of free and unspoiled woodland their sanctuary and their home. The place is, indeed, a natural aviary, and inasmuch as many of the birds are of kinds that are very rarely seen near London, it is to be hoped that measures will be taken — as in Wanstead Old Park—to secure them from molestation. The original cottage, thatched and covered with ivy and other creeping plants, contains four rooms and a china closet, with diamond-paned windows, and is said to have been built as a tea-house for George III. and Queen Charlotte.

* N. Hawksmoor being supervisor, and Edward Strong mason, with T. Kempster, up to the water-table. T. Bateman was clerk of the works in 1696 and in 1704.

The "Spinning House," Cambridge.

IT is stated that the Town Council of Cambridge have decided to erect a new police station and offices upon the site, in St. Andrew's-street, of the "Spinning House." It was established as a house of correction for both the University and the town, and to provide work, including the spinning of wool and flax, for poor people, under the will of Thomas Hobson, the carrier, who left some houses, and a capital sum of 100*l.*, in that behalf. Some years ago it was acquired by the University authorities as a house of detention for women of light character, but was closed in 1894, not long after the courts had ruled that in one particular case their power of arrest had been illegally exercised by the University authorities. The "Spinning House" stands on the west side of the street, and the demolition of the old gateway will remove a familiar landmark of the town.

Society of Painters in Water-colours.

THE exhibition of the Society of Painters in Water-colours, opened this week, is, as usual, strongest in landscapes; there is even less of interest in figure pictures than usual, for one cannot care for such a piece of flaring commonplace as the large drawing of "Nelson's Birthday at Naples" (151). Among the landscapes a special feature is the series of small studies chiefly of flowers and foreground by Mr. Parsons, one of which "Sea Holly" (146), is a quite perfect bit of coast landscape. Mr. Tom Lloyd shows his usual decorative feeling in landscape in "Harvesters" (45), where the level lines of the punt echo those of the bank and stream; his best work of the year is however "Noon" (128), where reapers rest under shade by a stream whose cool reflections contrast with the golden glow of the corn seen over the bank. Mr. Thorne Waite's "Shoreham Downs, Autumn" (6), is a very fine landscape both in composition and detail and in delicacy of execution. Mr. Eyre Walker, in "Under the Crags, Evening" (17), and several other works, seems to have been trying a new experiment in the way of a specially pervading warm yellowish tone in landscape; seen once it is effective; repeated in all his works this year, it becomes a little conventional. Mr. Colin B. Philips is even finer than usual in his grand hill scene, "Ben Cruachan" (13). Mr. Wilmot Pilsbury is a large contributor, and is becoming less hard in style, while not losing his real excellence of truth of detail; he is an artist who is rising higher in the scale, and adding sentiment to what was always good execution. Mrs. Stanhope Forbes's studies in special effects of colour and light are clever but hardly satisfying. Among other works may be mentioned three or four by Mrs. Allingham, always on the same level of excellence; Mr. Paterson's "Old House, Inverkeithing" and "Barbuie Avenue, Moniaive" (4 and 5)—his "Edinburgh" seen from an old quarry is a failure; Sir F. Powell's "Sunset, Arran" (61); Mr. Gregory's "Going out like a Lamb" (88), a charming study of spring foliage; Mr. Albert Goodwin's "Cities of the Plain" (99) and "Mont St. Michel" (149), the latter rather too much like a dream picture; Mr. R. W. Allan's "Home from the Herring Fishing" (116) and "The Taj from Agra Fort" (184), the latter a true hot sunshine picture; and Mr. Arthur Melville's clever colour studies in "blottesque" style (148, 157).

MAGNETISM.

THE "James Forrest" lecture at the Institution of Civil Engineers was given last week by Professor J. A. Ewing, F.R.S., the subject being "Magnetism." That the Council did well in inviting Professor Ewing, and in suggesting that he should lecture on magnetism, the result has proved, but there was a certain amount of truth in his protest that "it was like prescribing an ox roasted whole for an invalid's lunch." The discourse was enlivened by many humorous remarks and some striking paradoxes, which were much appreciated by the audience. Commencing with the history of the subject, he showed how quackery and superstition have found "magnetism" a name to conjure with. Five centuries before the Christian Era iron rings, which had been rubbed with loadstone, were sold as a remedy for gout. These ancient prototypes of the modern electric belt brought in a large revenue to the priests of Samothrace.

Although many of the applications of magnetism have been known for probably five thousand years, yet the science of magnetism only dates from 1600 A.D., when William Gilbert published his "De Magnete." This book entitles Gilbert to rank among the founders of experimental science and justifies the panegyric of Dryden:—

"Gilbert shall live till loadstones cease to draw,
Or British fleets the boundless oceans awe."

This verse caused the lecturer to remark that if Dryden had seen this year's naval estimates and heard the present talk about general disarmament he would have no misgivings about the permanence of Gilbert's fame.

He then gave a brief history of telegraphy to the present day, concluding by warmly congratulating Mr. Marconi on having succeeded in establishing wireless telegraphy between the South Foreland and Boulogne. In this connection he pointed out how Maxwell had proved that light waves were only waves of magnetic induction, and hence that all the visual signals "from the day when Eve first smiled to Adam" are examples of magnetic wave telegraphy. In surveying the history of the evolution of the dynamo, he emphasised the importance of the work done by the brothers Hopkinson, and showed how the dynamo has given us a new branch of engineering, which has already begun to overshadow the parent stem. In his opinion the use of the magnetic field to separate magnetic from non-magnetic substances is an application of magnetism that has a very promising future. Edison has designed crushing and separating machinery for plant in New Jersey capable of dealing with 5,000 tons of ore a day. It is said to produce a concentrate containing 67 per cent. of iron from crude ore containing only 20 per cent. An English syndicate has now taken up this system, and the prospector is already at work searching the Scottish Highlands for beds of mixed magnetic ore. In this search he has the valuable help of the magnetic survey of Rücker and Thorpe. Wherever local magnetic disturbances are marked, then it is probable that deposits of ore exist in the neighbourhood. The lecturer remarked that this was another example of what occurs over and over again in the history of scientific discovery, namely, a utilitarian application of work which at the time seemed only of abstract interest. In the application of engineering few things are more conspicuous than the ultimate usefulness of "useless" knowledge. Professor Ewing might have mentioned in this connexion his own researches in magnetism, which have proved of invaluable help in the whole region of electrical engineering, and yet were begun by him without the slightest idea that they would become commercially important.

He described and showed to his audience the latest forms of his hysteresis tester, permeability bridge, and magnetic balance. He also showed his magnetic curve tracer in action, throwing the magnetic curve on a screen by means of a ray of light reflected from a mirror. Owing to the persistence of vision one saw the whole magnetic curve clearly defined. The applause with which this exhibition was greeted was thoroughly well deserved, for it is

a most striking and instructive lecture-room experiment.

The researches of Mr. D. K. Morris on the effects of high temperatures on the permeability of iron were next described. Mr. Morris found that when iron is heated its permeability increases until the temperature attains 250 deg. Centigrade, when there is a sudden diminution. It then increases, but again falls off between 400 and 500 deg. C. From 500 deg. it increases very rapidly, until at 740 deg. its permeability is three times as great as at ordinary temperatures. At 760 deg. it loses all its magnetic properties, but at higher temperatures it becomes feebly magnetic again, and finally loses all its magnetism at 1.000 deg. C. Now, Sir W. Roberts-Austen's investigations on the cooling of iron from a white heat showed that it fell steadily in temperature except at certain places where apparently some internal convulsion took place associated with the giving out of heat. The temperatures at which these phenomena were observed coincide with the temperatures at which Mr. Morris noted changes in the magnetism of the iron. The inference follows that not only at the well-known critical point, but also at the other points, there must be a transformation in the structure of the molecules of the iron. The effect of prolonged heating of iron was investigated by Mr. Roget in Professor Ewing's laboratory, and he has clearly proved that there is a great increase in the hysteresis after prolonged heating—a result of great importance to electrical engineers.

In order to understand to what the phenomena of magnetism are due, we must make some hypothesis as to the molecular constitution of a magnet. Weber's hypothesis, that the molecules of iron are always magnets, and that the process of magnetisation is merely turning the molecular magnets round so that they always point one way, was shown to be sufficient to explain most of the magnetic phenomena, without the necessity of making any suppositions about molecular friction. Mr. Swinburne predicted from it that a piece of iron rotated in a very strong magnetic field would exhibit no hysteresis. This prediction has been verified experimentally by Professor Baily.

A model of a magnet consisting of thirty little pivoted magnets was shown, and their shadows cast on a screen. The odd way in which they grouped themselves in feeble magnetic fields was contrasted with the uniform molecular arrangement in strong fields. The lecturer thought that this model would be a great help in enabling engineers to understand other physical phenomena. In friction, for example, it is easy to believe that there are forces acting between the molecules of adjacent substances not unlike magnetic forces. When we make the bodies slide on one another these forces cause the molecular groupings to be broken up and reconstituted, thus giving rise to the dissipation of energy we are familiar with in friction. Similarly experiments recently carried out by Professor Ewing have proved that the plastic straining of metals is caused by a multitude of separate slippings of one part on another in each of the crystalline grains of which the metal is composed. If there are polar forces between the molecules the magnetic model illustrates how this would involve an expenditure of work. In conclusion, the lecturer eloquently encouraged students of research to continue their labours. The patient and intelligent worker may rest assured that his labours will find a return, not perhaps in profit or in fame, but in that pure impersonal joy of discovery which, as those who have tasted it know, is the investigator's best reward. At the close of the lecture, on the motion of Mr. Preece, a very hearty vote of thanks was given to Professor Ewing for his instructive and admirably composed discourse.

THE SANITARY INSTITUTE CONGRESS. — The Autumn Congress of this Institute will be held this year in Southampton, by invitation of the Mayor and Corporation, commencing on August 29. The annual dinner of the Institute will take place on May 2.

GLASGOW INTERNATIONAL EXHIBITION. — The ceremony of cutting the first turf for the foundations of the Glasgow International Exhibition was performed on the 22nd inst. The place selected was identical with that of the corresponding ceremony in connexion with the Exhibition of 1888, in the centre of the recreation ground to the south of the museum.

THE NEW GALLERY EXHIBITION.

THE Exhibition at the New Gallery will not add much to the lustre of the establishment—with the exception of two or three of the portraits, it can hardly be said to contain any picture of the first order, and the proportion of mediocre and uninteresting works is unusually large. It contains one moral picture by Mr. Watts which is pathetic and impressive in its way, but which can hardly be counted as one of his most important productions. This is "Dedication" (103), the subject and title of which seem to be a great puzzle to many of the visitors, though the meaning should be obvious enough. The lower part of the picture (an upright) shows a not very well painted stone altar on the face of which is indicated a bas-relief head of a smirking woman looking in a hand-mirror. The slab of the altar is strewn with the bodies of slaughtered birds, whose plumage makes a belt of iridescent colour across the centre. Above them a winged female figure, perhaps the angel or spirit of Nature, stoops as if in mourning, with her hands to her face. As a painted sermon it is serious and impressive; as a picture it is, in comparison with the best work of the painter, rather weak. Mr. Watts exhibits also a smaller work entitled "Peace and Goodwill" (115), a kind of Madonna and Child, the woman leaning back wearily with her head, turned sideways and thrown back, resting on a support in the rear; the hand of the master is betrayed mainly in the broad treatment of the warm-coloured drapery about her shoulders. There seems to be an intended moral in this too; Peace is weary and despairing—so at least we read it. Then there is a portrait of Lord Roberts, in which there is more of G. F. Watts than of Lord Roberts.

The fact that the exhibition contains a large work, crowded with figures, by Mr. Holman Hunt, is of course the point on which the managers chiefly rely. It represents "The Miracle of the Sacred Fire in the Church of the Sepulchre Jerusalem" (80); the scene and the intention of the picture are described at length in the catalogue. Without the description it would be difficult to make any point or meaning out of it. It shows the interior of the church with an immense compact crowd of figures and faces, none of which detach themselves clearly from the mass, the whole appearing almost on one plane, so that the background figures seem to be only on a smaller scale. The attitudes of the foreground figures most in action are stiff and awkward—see especially the figure of the man running through the centre of the foreground groups. There is no interest either of composition or sentiment; it professes to be a realistic representation of a curious scene; but a "picture" in the artistic sense it is not; and it fails even of realism. It impresses itself on us as a rather melancholy exhibition of conscientious but wasted effort.

Among the few pictures, other than landscapes, which aim at a special artistic sentiment two are notable in addition to Mr. Watts's "Dedication." Mr. John Collier's "Evil" (236) shows a melancholy landscape, closed in by a high bank from which three or four tree-trunks rise against the sky, and in the foreground a crouching woman in a red skirt, with her hair down and a wicked gleam in her eyes, which is hardly borne out by the rather weak expression of the mouth. It does not rise (or sink) to the ideal suggested by the title, which we suspect was given after the picture was finished: still there is something in it. The other work we referred to is Mr. Austen Brown's "In a Calf Shed" (150), in which an everyday subject is treated as the basis for a powerful and suggestive effect of light and colour; there is a kind of "Old Master" style about the picture, which is a fine and effective one of its kind. Mr. Tuke's "Cupid and Sea Nymphs" (189) is amusing enough taken in conjunction with the title; the "sea nymphs" are only distant figures and do not affect the picture; the "Cupid" in the foreground is merely one of the artist's usual clever studies of a nude lad, as in his pictures of boys bathing; a bank holiday youth stripped; the title seems almost to have been given as a joke.

It would be difficult to select any one as the portrait of the year *par excellence;* there are several however that are remarkable for force and character. Among those of women which rise above the level of what we call "dress" portraits, Mr. Shannon's "Mrs. Senior" (170) is the finest, and comes nearest to being a picture rather than a mere portrait; the figure is seated sideways to the spectator, and the whole painted in rather soft half-tints, the figure seeming to blend with the curtain background; the face is very beautiful and expressive. This is what may be called an intellectual type of portrait; no mere painting of a costume with a face at the top, but a work which is an artistic whole. In his full-length of "Lady Cavendish Bentinck" (199) the same artist has attempted what may be called a Reynolds portrait revived; it is striking and dignified, but a little too palpably a revival in style to look quite sincere. Mr. Spencer Watson's seated portrait, full face, of Miss Latham (188), though hard and cut-out in effect, is an interesting colour study, a harmony in red, black, and blue, the face somewhat too highly coloured by the reflected colour of a broad-brimmed red hat, so as to look rather heated: but it is an original work. Among the portraits of men Mr. John Collier's "With Kitchener to Khartoum" (192), a seated portrait of a war correspondent in shirt-sleeves and riding-boots, writing on a note-book, has much spirit and life. Mr. Sargent's portrait of "Colonel Ian Hamilton" (149) has a touch of the heroic, and is effectively contrasted with Sir George Reid's likeness of the "Rev. Alexander MacLaren" (153), which is hung as a pendant to it; the expression of the shrewd and keen face is very well given. Among small-size portraits Mr. Jacomb Hood contributes two spirited and characteristic examples, "Mr. Denis O'Sullivan" (27), and Miss Frances Forbes-Robertson (165) in a fencing costume, holding a foil; a very spirited little work.

The landscapes that are of any importance are soon reckoned up. The most important is a sea-piece by Mr. Napier Hemy, "A Derelict Boat" (180), which has come nearly in the path of a fishing craft in full sail, tearing through a rough sea which is given with much freedom and movement, and in a style of execution which looks rather like a new departure on the part of the artist. Mr. J. L. Pickering's "The Shadow of a Storm" (146) is a sketch of effect, on a large scale, rather than a finished picture; but it is very powerful, and would lead one to look with interest for future work from its author. It is a loss to the exhibition that Mr. Adrian Stokes, who has generally furnished the strong point in landscape at the New Gallery, sends only one small work, "St. Ives" (89). Mr. R. W. Allan's "In Shelter" (123) is a coast scene with fine free open-air effect, the boats perhaps a little too ostentatiously "broad" in handling. Mr. Robert Little's "A Dream of Italy" (97) is an imaginative landscape of a kind which is not often seen now, and carries us back to the days of Richard Wilson, though with a much warmer and richer colour than Wilson ever employed; the middle distance is filled by a hill whose rounded outline is contrasted by the horizontal lines of a large castle building running along part of it; behind is a silhouette of faint purple mountain rising higher and backed by warm-tinted clouds; the whole a suggestive and poetic work. Other landscapes to be mentioned are Mrs. Corbet's "Lower Farm, Eskdale" (50), Mr. Arnold Priestman's "A Swamp" (44), a good "desolation" picture; Mr. Arthur Tomson's moonlight sketch "On the Chiltern Hills" (114); Mr. Corbet's "From Volterra" (128), a rather conventional but carefully-studied landscape, somewhat reminding one in its distances of De Köning's work; Mr. Alfred East's "The Land that Shakespeare Loved" (200), which, however, does not strike us as answering to the title—it is rather devoid of specially English character; Mr. Thorne Waite's "The Down Farm" (220), and Mr. Parsons's flat coast landscape "Sea Holly and Sea Lavender" (237), a good work, but not equal to his small study of the same subject in the Society of Water-Colours exhibition.

Among works not included in the foregoing category are Miss Flora M. Reid's little picture "New Mown Hay" (69), noticeable for its fine and broad treatment, two capital bear pictures by Mr. Nettleship, and among the water-colours in the Balcony a fine work by Mr. Arthur Hughes, "Benedicite" (394), an idealised figure of a girl seated in a bay window playing on a violin, with a bright sky and white clouds seen through the window bars; rather recalling in sentiment the left hand compartment of the same artist's triptych, "Viola d'Amore," in the Royal Academy three or four years ago.

The sculpture is not important; the only large work, Mr. Taubman's "Adam and Eve," is not very interesting, and Mr. Goscombe

John's "Memorial Figure," a realistic bronze of a girl seated, clad in ordinary frock and shoes, is not sculpturesque, and is so unlike this artist's usual ideals in sculpture that we fancy it is done to please a client rather than himself. Among the small works are Mr. Onslow Ford's small replica of his "Folly,". Miss Halse's "The Morning Star," a little nude figure (apparently wax) poised on tiptoe on a small sphere which rests on the apex of a pyramid; Mr. Colton's clasp in enamel and steel, Mr. Drury's head called "The Little Thinker," Miss Rope's small decorative panel "Mermaids," and Mr. Simonds's decorative panel in *gesso duro*, "Music."

FISHMONGERS' HALL: THE SITE AND FORMER BUILDINGS.

On the occasion of the visit of the Architectural Association to the Fishmongers' Hall, to which we have already referred, Mr. H. Chatfeild Clarke read a short paper on the history of the Company and of the site. The following is the portion of his paper referring to the site and buildings:—

"Fishmongers' Hall, Thames-street, was anciently the site of four tenements in the time of Edward III., to which a fifth was afterenumerated, and the conveyances of the five tenements prove the site to have had a frontage of 120 ft. next Thames-street and an average depth from thence to the river of 200 ft. In Henry VII.'s reign the Stock Fishmongers adopted Lord Fanhope's house in Thames-street as their place of meeting, and when both Companies were finally united this house was agreed upon to be their Hall, and was practically the gift of Lord Fanhope, subject to certain payments. The site stood at the south-east end of Upper Thames-street between what was Water-gate and Old Swan-lane, and the total property was intersected by several stairways to the river—Water Gate, Churchyard-alley, Fleur de Luce-alley, Black Raven-alley, Ebgate-lane, or Old Swan, and, after the Fire of London, by an additional alley called Wheatsheaf-alley. Several of these alleys still exist, as you are aware, and retain their ancient names.

Description of Old Hall.

The first hall does not seem to have been a building of any great age or duration. The term "Fanhope's House" implies that the Fishmongers only occupied that mansion at first, and the attaching of additional erections to it forming the whole into their Hall must have taken place subsequently. There are no plans of this hall to be found, but from a small plan by Hogenberg it appears to have been a large square pile of masonry with towers at the angles and a central gateway towards the river. In Hollar's four-sheet view of London, 1647, we perceive two courtyards, evidently formed by running a dining-hall across the original quadrangle. The interior is not described in the company's books, but an heraldic visitation at the British Museum enumerates twenty-two coats-of-arms of Lord Mayors as having been amongst the stained glass in the old hall, some of which are said to have been in the gallery and some in the glass at the hall door.

The fire of London must have attacked Fishmongers' Hall as one of its first large buildings, and reduced it and all the surrounding buildings to mere foundations. In February, 1667, the court ordered their carpenter 'to have a note of all the company's houses lately burnt and where they were situated, that he might look to the foundations of them and see that the company were not wronged by the building of walls on such foundations as party walls, when the same belonged only to the company.'

In 1667 and 1668 Mr. Edward Jarman, the Company's Surveyor, was negotiating regarding various tenancies, &c., of properties surrounding the hall, and in May, 1668, 200,000 bricks were ordered for building at Fishmongers' Hall, and the hall was agreed to be enlarged to 33 ft. wide by 66 ft. deep. The new hall was completed in 1669, and the Company's books transferred thereto in February, 1670. Mr. Jarman, the architect, was also architect to the Drapers' Hall after the fire of London. We have both an engraving and a coloured drawing of this hall. The buildings environed a square, handsomely paved court—the dining hall being on the south side of the court—containing a capacious gallery running round the whole interior.

The present hall was built in 1831 from designs of Mr. H. Roberts, the builders being Messrs. Cubitt & Co. A set of the drawings are shown herewith. The building was set back westward about 40 ft. by the new London Bridge. As will be seen by the drawings, many of the floors are built with brick or tile arches, and the premises are extremely solid throughout, the roof over the banqueting hall being copper. The dimensions of the hall are 73 ft. by 38 ft. by 35 ft. The severe, but pleasing, style of the building speaks for itself, but what strikes one throughout is the extremely pleasing proportions of the various rooms. The hall was decorated in 1863 by Owen Jones, and the decorations have never been renewed until last year."

THE INTERNATIONAL BUILDING TRADES EXHIBITION.

On Wednesday Professor Aitchison, R.A., opened this Exhibition at the Agricultural Hall, Islington. A number of gentlemen interested in the Exhibition having briefly inspected some of the exhibits, the party proceeded to the gallery, where the opening proceedings took place. Among those present were Sir Arthur Blomfield, A.R.A., Mr. J. W. Swan, F.R.S., President of the Institution of Electrical Engineers, and Messrs. W. A. Pite, E. O. Sachs, E. J. Lovegrove, Henry Holloway, E. Woodthorpe, Gale, H. Greville Montgomery (the manager), and others.

Professor Aitchison, in declaring the Exhibition open, said that they had assembled to open the International Building Trades Exhibition. Most persons would allow that it was an important exhibition, as the mere fact of building even in so great a capital as London forced attention to it even while passing in a vehicle, but it was only when we considered the great number of industries that are necessary to it, that we could form a true idea of its importance. No building of brick, of stone, or of concrete could be erected without lime or cement, at least in this country (for we read of Babylon being built of bricks and asphalt). Who was the inventor of mortar we did not know, but we knew that the Pyramids of Gizeh were put together with it. Lime generally involved a quarry from which the limestone had to be extracted, the building of kilns, and the use of some sort of firing, carts and horses to draw the quick lime, and roads to draw them on, the building of carts, the leather and iron work for the horses, and food, clothing, and habitations for the men and stables and food for the horses, not to speak of the men and materials required for making the road. It was to the necessity for limestone and fuel that we owe the destruction of so many temples and other grand classical monuments, and when he told them that the marble of the Mausoleum was used by the Knights of Rhodes to burn into lime for the repair of the walls of the Castle of Budrum just before it was taken by Solyman the Magnificent, they would not be surprised at the havoc made among the priceless monuments of antiquity, mainly from the same cause, the roofs being used for the fuel. Viollet le Duc gave a long list of all the trades and occupations that were involved in building. They were present, however, to see new inventions and new applications of machinery to their craft. The exhibition was more or less useful to every one, but it was particularly so to the architects. The application of machinery to all sorts of productions had been of immense advantage to all those engaged in building, and, of course, no less useful to those who occupied the buildings that the architect had designed and the builder executed. He might mention a peculiar use that he had seen one of the modern inventions in the exhibition put to. The invention was a sheet of wire-work. At the intersection of the wires small pieces of terra-cotta were strung on. Some of this wire-work he saw had been bent into the shape of a groined roof, and when plastered inside and out it made a very stiff and apparently serviceable roof, and if it only had the incombustible qualities that were claimed for it, it would be a very valuable preventive to the destructiveness of fire. There were doubtless hundreds of other serviceable inventions exhibited which might be used by the architect and the builder. He might mention one application of machinery to joiners' work that he was peculiarly grateful for. He once wanted to use some square moulded balusters, and the expense of working these by hand was too great to allow their use being thought of, but he found an exhibit here that had been worked by machinery which so much reduced the cost as to enable him to use the balusters. The ancients had used the fall of water and the force of wind for mills and ships, but just before our time the application of steam had increased our power of production at least a hundred fold, and Tennyson, whose poems were published in 1832, spoke of its last triumphs

> "In the steamship, in the railway, in the thoughts that shake mankind."

Shortly after that we had the electric telegraph, which has rivalled Puck's boast: "I'll put a girdle round about the earth in forty minutes." Electric lighting had come, and when we considered the progress of electrical science since the days of Pliny the Elder, to our knowledge of it to-day, to the X-rays which had shown us an undeamt-of power, it opened a vista which almost paralysed us to contemplate. On the present occasion there were exhibits of electrical appliances for lighting which had made a revolution in the illumination of houses and cities, and enabled us to get effects that were never even dreamt of before not to speak of the application of electricity as a motive power. One of the great revolutions that had taken place in his time had been the increased wages of the working class, and now it was they who gave the great stimulus to production; but, like other revolutions, it had not been wholly advantageous, for it had been the means of encouraging what he might call the manufacture of rubbish. Up to a comparatively late period England was celebrated for the excellence of her workmanship. English cabinet work was known abroad for the excellence of its wood and fitting and for the absence of artistic design, and England was, he hoped, still celebrated for the excellence and durability of its machinery; but in some classes of manufacture it was almost impossible to get anything that was really good. There was an insane desire to have things cheap, without regard to their excellence and durability, or even their temporary utility. The bulk of English cabinet work was very different from what it once was; small fastenings that had the appearance of solid brass bent in your fingers as if they were lead, while sash-lines and chair-bands were made of some stuff that was scarcely stronger or more durable than tinder. In certain trades there was a counterpoise to this passion for rubbish; in all the things that had to do with health, that were commonly called sanitary appliances, perfection of workmanship was one of the necessities. This was of an immense advantage to the workman and manufacturer; it taught them to be thorough, careful, and accurate, and not to scamp, for the tests which sanitary experts had learned to apply instantly discovered imperfect work or materials. Twenty or thirty years, or still longer, ago, he pointed out the enormous advantage it would be in manufacturing towns to have the whole outer faces of buildings covered with enamelled bricks or enamelled terra-cotta. This was done with white or pale-coloured bricks when there were questions of light to the premises themselves, or to those of their neighbours, but the appearance of such buildings was rather more hideous than when they were built of the ordinary brick. There were ridiculously few buildings of enamelled brickwork or earthenware where any attempt was made to give to them beauty of form and colour. This was due to three causes—to the wretched leasehold system; to the time required, and the accidents inherent in the potter's trade, both to shape and colour of fine earthenware; and to the desire of people to get artistic designs for nothing. As to the advantages, in the first place, dust and soot did not cling so much to a polished face as they did to rough and porous surfaces, and that which did stick might be pretty well cleared off by the free use of a water hose; but the thing he wished most to insist upon was the great importance to mankind of beauty both in form and colour. It could not be supposed that Nature did not know her business, and that her making almost all her works more or less beautiful in form and colour was not of some advantage to man. To him it seemed certain that all these beauties which pervade the earth, the air, and the ocean were intended for man's purification, solace, and delight, and that in great towns, where Nature's beauties were shut out, and where even the sky was obscured by smoke and dust, there must be a necessary lowering

of man's intellectual and moral powers unless those gifted men who could impart beauty were employed to confer those beauties they had culled from Nature on the habitations, the furniture, and the utensils of town people. The late Charles Garnier, who was the greatest architect of our time, published in 1869 a book he called "Through the Arts" ("A Travers les Arts"), and in that he gave his dream of the beautification of Paris. "I picture to myself," he said, "the day when the tawny tones of gold will mark the monuments and constructions of our Paris; I imagine the warm and harmonious tints which will tremble under our charmed gaze. One will then have renounced those grand right-angled streets, beautiful beyond doubt, but as cold and formal as the etiquette of a noble dowager. The present inflexible regulations will have their period of reaction, and without hurting anybody each man will be able to build his house without making it exactly like his neighbour's. The grounds of cornices will shine with eternal colours, piers will be enriched with sparkling panels, and gilded friezes will run the length of buildings; the monuments will be clothed with marble and enamel, and the mosaics will make all in love with movement and colour. This will not be mean or false luxury; it will be opulence, it will be sincerity. The eye familiarised with all these marvellous tints and brilliancy will necessitate our costumes being modified and being coloured in its turn; the whole town will be one harmonious reflection of silk and gold." To take a modern instance, he (the speaker) thought our modern manufacturers might take a lesson from Wedgwood, who not only took the greatest pains to render his ware excellent, but also used as his designers the most celebrated artists of the day, and for this reason his ware was called for in every part of Europe, and, he expected, might be found serving its purpose now in many out-of-the-way places. When he first went to Italy, in 1853, it was quite common to have one's meals served on Wedgwood ware. But Wedgwood was only a tardy imitator of the originators of this traffic, the Egyptians and Phœnicians. Schliemann found some of the blue glazed earthenware of Egypt in Agamemnon's Palace at Mycenæ. This ware bothered the translators of Homer, who had no idea of the trade in blue ware, and in the description of Alcinous' Palace in the Odyssey, Pope supposes it to be metal—

"The cornice high
Blue metals crown in colours of the sky."

And after these great traffickers the artistic Greek exported his vases and other fictile ware, enriched with representations from his poets or from folk-lore of his country. Those storied jugs, dishes, goblets, and coolers now filled the museums of every civilised country in the world, and were their most cherished possession and their greatest boast. He had dwelt on this at great length, for he still hoped that our country might furnish to the whole world artistic productions which might vie with the works of Flaxman, if they did not equal the superhuman excellence of the Greeks. The saying of John Addington Symonds should be imperishably engraved on the minds of all those who deal in artistic wares—"Nothing is imperishable but high thought, to which art has communicated the indestructible form of beauty."

Mr. J. W. Swan proposed a vote of thanks to the Chairman for his remarks. In England, he said, we suffered from conservatism—a source both of weakness and of strength. We were too apt to adhere to old methods when new and better ones were pointed out, and it required such an exhibition as the one they were opening to make known the improvements which had taken place in the building art.

Sir Arthur Blomfield seconded, and the motion was heartily agreed to.

A photograph of the party having been taken, an adjournment was made to the dining-hall, where luncheon was provided, Mr. Montgomery presiding.

The toast of the Queen having been honoured, the Chairman proposed the health of Professor Aitchison—"one of the most eminent of living architects and the most genial of men."

Professor Aitchison, in response, said "praise undeserved was satire in disguise." It had been a pleasure to him to open the exhibition and to meet so many of his brother architects, and to do a little towards the prosperity of the exhibition—one of the most useful and interesting which had been held in that Hall. Such an exhibition not only made architects and builders acquainted with new inventions, &c., but it gave the outside public an opportunity of seeing them too. He believed that the exhibition would be a success, and thought that thanks were due to the Chairman for the great time and trouble he had taken in the matter.

A vote of thanks to the Chairman brought the proceedings to a close.

The exhibition will remain open until Saturday, May 6, and the next Building Trades' Exhibition will be held in 1901. The following is the programme of arrangements:—Thursday, April 27, Visit of the Institute of Builders; Friday, April 28, Meeting of Association of Municipal and County Engineers; Saturday, April 29, Meeting of Association of Municipal and County Engineers. Visit of the Institute of Sanitary Inspectors, 3.30; Tuesday, May 2. Visit of Surveyors' Institution 3.30; Wednesday, May 3, Clayworkers' Institute, Annual Meeting and Dinner; Thursday, May 4, Visit of Society of Architects, 3.30; Friday, May 5, Meeting of Association of Municipal and County Engineers, 3.30. Lecture at 8.30 p.m. by the Hon. Rollo Russell, M.A.; Saturday, May 6, Meeting of Municipal and County Engineers, 3.30. Visit of Architectural Association, 3 p.m.

THE EXHIBITION.

The title of International may be fairly granted as legitimate, for many of the novelties which are contained in the show come from America or the Continent.

Novelties, however, are not superabundant, nor are they to be expected in overwhelming profusion in any exhibition connected with the building trade, which has been gradually attaining its present position by two thousand years of growth and development. There are, nevertheless, sufficient novelties to make a visit to the exhibition both pleasant and profitable to all our readers, and whilst there are a goodly number of new names in the catalogue, it speaks well for the utility of the exhibition, both to the exhibitors and their customers, that many firms who have been represented in the past are once again to the fore.

The most striking characteristic of the exhibition at a first inspection is the marked improvement in the artistic character of the design evinced in the stock patterns of manufacturers. There must be an improvement in the taste and appreciation of the British public to render it commercially profitable for manufacturers to stock and exhibit such admirable designs as are to be seen, for example, in the fireplaces and chimneypieces of Messrs. Yates, Haywood, & Co., the door furniture of Mr. James Gibbons, the glass work of Walter J. Pearce, Limited, and the remarkably well-designed mantlepieces of Mr. John P. White.

A special feature in the present exhibition is the grouping together as separate collections of the manufactures, and methods of construction connected with road surveying, electricity, and smoke abatement; the road surveying exhibit being located in the gallery, the electrical section in the minor hall, and the smoke abatement section in the King Edward's Hall. In the general section of the exhibition the bulk of the space is occupied by the exhibits of stone, brick, and other clay goods, and plaster or cement, which form the backbone of the show, as they do naturally of building generally, but all trades connected with building may be said to be fairly represented with perhaps the exception of ironwork and fire-resisting construction.

Amongst the novelties may be noticed the exhibit of the British Non-Flammable Wood Company, Limited, in which are included examples showing that the process does not impair but rather improves the quality of timber in respect of the appearance at least of articles made from it. Examples of polished wood in furniture and of constructive joinery show the possibilities of the treated material.

Adjoining this exhibit is an interesting novel material recently introduced from America and called "compo-board," shown by The British Compo-Board Company. This is made of a wooden core covered with paper on each side, treated to make the finished material resistant to moisture. It is prepared in two thicknesses, $\frac{1}{16}$ in. and $\frac{3}{8}$ in. The sheets are made in 4 ft. widths and up to 18 ft. in length, and can be fixed to studding by nailing or to walls by cementing. It is capable of a certain amount of flexure, and will take paint, distemper, or paper well, so that it is suggested as a solution of the plastering difficulty. It is claimed that the material is fire resisting as well as damp-proof, and of slow temperature conductivity.

A very different treatment of wood is that shown by Engraved Wood, Limited, wherein quasi-carved panels are manufactured by enormous pressure. For a cheap profusion of ornament in repeated patterns as a substitute for carving the process will, no doubt, find many ready to make use of this material.

In the next stall is another decorative idea in woodwork, the employment of eccentric turned spirals in the preparation of what is called Saracenic Land woodwork for Moorish fitments, grilles, screens, &c. This is shown by the Wood Carving Company, Limited, who also exhibit pressed wood mouldings and carvings.

It may somewhat justly be objected that such treatment of wood is illegitimate and meretricious, and lends itself rather to vulgar ostentation at low cost. There are, however, people who desire such ostentation, and the demand is met by the supply. Of quite a different calibre is the woodwork to which we have already alluded exhibited by Mr. John P. White. Here all is legitimate in treatment, original and clever in design, this manufacturer having wisely gone to some of the most talented of modern designers—albeit somewhat of the Arts and Crafts school—for the drawings from which to work. The execution is good and the combination of excellent design with good workmanship leads to an eminently satisfactory result.

Green stain has now descended to the level of Tottenham Court-road, otherwise the turpentine stains shown by Thos. Fewster & Sons, Limited, might have been received with greater enthusiasm. Fewster's stains are, however, not confined to green, but embrace a wide range of colours and, judiciously employed, there are still possibilities in wood-staining which may well be exploited by the help of these excellent manufactures.

Of washable distempers we have had many and not altogether happy experiences, and one is, therefore, inclined to welcome such a material as "Vernolene," a new water-paint prepared by Mejer, Greenwood, & Son, Limited, if it can but substantiate the claims made in its favour as being non-absorbent to moisture, of equal body and greater durability than oil-paint, cheap, and capable of resisting the deleterious action of lime and gas.

The potentialities of the products of the modern glass worker are well shown in the kiosk of Walter J. Pearce, Limited, wherein is exhibited ample proof that we are now no longer restricted to pot metal or cathedral glass, but have at our command an almost bewildering variety of opaque and semi-opaque or translucent vitreous material.

The defective methods of fixing the capping, which are to be found in some forms of roof glazing, are cleverly avoided in the system shown by Mr. Samuel Deards, which may be briefly described as an adaptation of the principle adopted in securing the cappings of zinc rolls, projecting pins fitting into suitable cuts in the underside of the capping material.

The Sanitary Lead Lining and Pipe Bending Co., Limited, have a very useful material in their lead-lined iron pipes, in which the advantages of lead for soil and waste pipes are maintained with the added security and strength of iron protection, thus providing a smooth and non-rusting pipe, with the possibilty of sound joints and the avoidance of the chief objections of iron pipe for sanitary work; the total cost is stated not to exceed that of ordinary 8-lb. lead. A good feature in this firm's work is the provision of screw caps at bends and junctions, rendering inspection and cleansing possible.

One of the best stands in the Exhibition, both for the arrangement and design of the fitting up, as well as for the excellence of the wares displayed, is that of Mr. James Gibbons, to whose door furniture we have already referred. Good design and good workmanship are here allied in the builder's ironmongery and brass work that is shown.

An ingenious form of light steel paling is shown by T. W. Palmer & Co., made of thin sheet metal perforated and held together by self-formed clips. The same firm also exhibit good examples of unclimbable and other iron railings and gates.

The patent trucks of Mr. H. C. Slingsby are of a clever and useful nature. The peculiarity of the trucks is that of the four wheels—two are on a fixed axle under the centre of the carriage, but the others are in front and

behind free to slide upon a long axle and thus automatically adjust themselves to turning movements whilst preserving a remarkable steadiness and evenness of running. The trucks are adaptable for all kinds of purposes which they are made to suit.

Arthur Koppel, of Berlin, exhibits some good forms of steel tipping wagons, both side, end and all round tipping and portable light railways, with switches and turntables which would be useful in many factories. Similar goods are shown also by C. A. Zadig & Co.

A novelty in slating is to be seen at the stall of Arthur Lee & Brothers, Limited, the slating being arranged lozenge wise, screwed to battens, and effecting, it is claimed, a large saving of labour and material. Specimens of American slates are also exhibited, which are interesting.

From America comes, too, the Bundy time recorder, shown by The British Bundy Company, and intended to facilitate the accurate and indisputable record of the time at which employees commence and leave off work, a matter of considerable importance where large numbers of workmen are employed.

Building stones are not well represented in the Exhibition, although many samples are shown in connexion with the special exhibit of surveyors' materials. Excluding these for the present, and confining our attention to the ground floor, we find a neat little stand of Weldon stone from near Kettering. The Weldon quarries, after being worked for many years as stone mines, are now exploited in the open, and are found to yield a face of workable material at least 18 ft. in depth, and there is but little overburden, as the photographs show. This stone is a cream-coloured oolite, varying from fine to medium grain, and it contains but few concretionary "tears." With a view to demonstrating its durability, a panel, dated MDCXC., found amongst the ruins of Kirby Hall, near Weldon, is shown. The letters are clean cut, and still remain remarkably sharp.

Several slabs of the well-known Dundry freestone, from near Bristol, are exhibited. This, also, is a cream-coloured oolite, and is being used in the restoration of Bristol Cathedral, amongst other works.

Messrs. Joseph Brooke & Sons have utilised their York stone from Hipperholme, Lightcliffe, and other localities, in making a broad pavement, with steps, which admirably demonstrates the value of the material for landings, pavements, and the like. The same firm has a good exhibit of white and coloured glazed bricks, ornamental and moulded bricks for string-courses, &c. The stand contains a good assortment also of air-bricks, sinks, baths, salt-glazed bricks, &c.

Amongst the artificial stones we noticed the light cream and whitish coloured sandstones of the Owen-Stone Company, the exhibit of which consists of a bay with two large entrance pillars erected. The use of this artificial material is well shown in an elaborate panel, an ornate mantelpiece, and in other ways. Some interesting particulars concerning the strength of the stone are given. Samples made for one month before being tested show that 78·72 tons per square foot were required to crush the stone; whilst a sample which was one year old withstood a pressure of 222·4 tons per square foot, others coming out at 107·5 and 185·07 tons per square foot respectively. This seems to indicate that the stone improves by keeping, and that some of it is much stronger than other samples. The highest figure quoted is certainly a remarkable result for an artificial stone. Some comparisons are made between the strength of bricks composed of the stone and London stock bricks, to the advantage of the former; but the term "London stock" is too wide to enable us to appreciate the results furnished.

Crown Dale stone is somewhat similar in appearance; a glass case containing mouldings and other examples is on view. This stone is stated to be made of silica and lime subjected to heat and pressure, whereby a silicate of lime is formed as the matrix. It looks like a fine-grained sandstone, and is made in several tints. As with many other serviceable artificial stones it is sent out ready for fixing.

The Patent Indurated Stone Company has a stand of grey stone paving and balustrading, together with samples of stone, silicated concrete tubes, &c. The material appears to be very homogeneous, and is nice and clean. It consists of crushed Leicester granite, washed by machinery, bound together by cement, and formed in steel lined moulds. Slabs thus made are afterwards hardened by a chemical process, and then seasoned in stacks for six to nine months. The crushing strength of the stone, three months old, is given as 7,134 lbs. per cubic inch. This indurated stone is also employed as architectural stonework generally for sills, sinks, copings, troughs, mantelpieces, string courses, &c.

Petrifite is well exhibited, and a large variety of articles made of this mixed with various substances are on view. Artificial stone, mortar, concrete, and bricks are amongst the numerous applications of petrifite. A somewhat similar cement, known as "petrifine," is also shown. One of the advantages of this, which is of special use for interiors, is that it dries so quickly; work may be commenced and finished in a day. It is stated that petrifine may be mixed with either sea or pit sand, and no efflorescence occurs. For the finishing coat the neat cement alone is employed.

Other exhibits are by the Norton Stone and Concrete Company and the Moreau Marble Company. The last-mentioned makes an artificial marble by treating absorbent natural stones, and whilst nobody could mistake the artificial marble for the real thing it is certainly very creditable, and the exhibit is altogether an effective one.

A slab footway set *in situ* is exhibited by the Bristol Corporation; waste from refuse destructors is employed in the manufacture of the slabs. These latter are close-grained and have a roughened surface, produced by numerous small elevations rising from the general surface. The same Corporation shows a carriageway of granite setts.

Messrs. A. C. W. Hobman & Co. exhibit, amongst other things, a stairway the upper portion of which is made of Clifton stone, consisting of ground Kentish rag and cement, whilst the treads of the lower portion are of white marble chips in cements of various dark colours. Specimens of granolithic paving, window sills, and balusters also form part of this exhibit.

Examples of Roman and Venetian marble mosaic, Venetian glass mosaic, and Ceramic mosaic are shown by the Mosaic Manufacturing Company. Samples of Venetian and Roman marble mosaics, and designs of various works already executed are shown by Messrs. Diespeker & Co. Mr. C. H. Broodbank, in addition to a number of slates from Angers, exhibits samples of American "marbleised" slate and enamelled slate, which are certainly excellent imitations of real marble. Attempts at producing breccias, however, are not as successful as some of the others; there is a lack of sharpness in the outlines of the imitation fragments. The same exhibitor has examples of small circular tables made entirely of slate; a special feature of these is the facility with which they may be taken apart and packed in a small compass.

Specimens of cement and mosaic tiles are shown by the Italian Artistic Tile Company; they are of ornate appearance, and exceedingly strong. Experiments show that test pieces withstood a crushing load of 3·42 and 4·22 tons per square inch respectively. The percentage of water absorbed is given as 4·78. These mosaic tiles are kept six months before being sent out. The same company exhibits some curious Italian terra-cotta. The clay is evidently artificially mixed with chemical preparations, and when burnt has a mottled aspect, green evidently being the favourite colour. Regarded at a distance, this terra-cotta somewhat resembles majolica, but it has the advantage of a dull surface and is not glazed in any way.

The exhibition of bricks and tiles in the show is a large one, but not as great as other clay goods, such as stoneware pipes, chimney pots, sinks, and sanitary ware generally. Messrs. James Oakes & Co. have built a wall in which their red surface shale bricks and pit shale bricks are well displayed. The former are made from coal measure shale, or clunch, from tip heaps; whilst the latter bricks are composed of underclays from beneath the coal seams near Alfreton. The mean crushing strength of these Alfreton bricks is given as 376·4 tons per square foot; and they have an average porosity of 3·23 per cent. Other firms exhibiting bricks are Messrs. Rockhill Bros., who have a fine show of fire-clay goods. The New Malden Potteries and Brickworks, Limited, have a number of clean-looking, red sand, moulded and machine-pressed facing bricks, sewer bricks, drain-pipes, &c. Messrs. Herbert Alexander & Co exhibit a number of well-known bricks as illustrations of the work turned out by their brick-making machinery.

One kind of brick is made from crushed slag mixed with cement. The Ketley Brick Company exhibit red terra-cotta ware, comprising window sills, window and door heads, copings, pillar caps, panels, &c. A small building has also been erected in red terra-cotta and pressed red facings, which forms a very effective exhibit. The Rowlands Castle Brick and Tile Works, Limited, exhibit a number of moulded and ornamental bricks which are amongst the best of their class in the Exhibition. Also a number of rubbers, roofing tiles, &c. Messrs. S. & E. Collier show an assortment of bricks, tiles, terra-cotta, air bricks, finials, and agricultural drain-pipes. Messrs. Wood & Ivery, in connexion with their exhibit of Staffordshire blue bricks, have a section of the conduit as utilised in the Birmingham water scheme, the conduit being lined with their blue bricks. Messrs. H., J., & C. Major show several of their patent weatherproof roofing-tiles, Roman pattern, fixed *in situ*, together with specimens of bricks and tiles, and Portland cement. Mr. Mark Gentry, in a large stall of red clay goods, exhibits red facings, rubbers, arch bricks, and moulded and enriched bricks. Some of the arch bricks are 2 ft. in length and thin—tapering off towards one end. Messrs. Colthurst, Symons, & Co. exhibit tiles nibbed and holed for nailing, amongst other clay goods, nearly all of red tints. Messrs. G. Tucker & Son and the Somerset Trading Company have also a good assortment of bricks and tiles. Messrs. Julius Hülsen & Co. illustrate their method for preventing scum and discolouration on facing bricks and terra-cotta.*

ST. GEORGE'S CHURCH, LIVERPOOL

A SPECIAL meeting, convened by the Liverpool Architectural Society, was held on Thursday, the 20th inst., for the purpose of debating the proposals regarding the demolition of St. George's Church. There was a large attendance, including, besides members of the Architectural Society, several representatives of the Historic Society of Lancashire and Cheshire and the Liverpool Academy of Fine Arts. Mr. W. E. Willink, President of the Society, occupied the chair, and in his introductory remarks said the Architectural Society felt that in the interests of their art they should make an effort to get the tower and spire retained. The loss of the tower and spire would be one that could not be lightly repaired.

The Bishop of Liverpool wrote: "I think it very unlikely that it will be a popular step to pull it down. I doubt extremely whether anything better will be put in its place."

Professor Simpson (University College) moved the first resolution as follows:—"That from æsthetical and historical considerations the demolition of St. George's Church tower and spire would be an act very greatly to be regretted." He said that historically the tower and spire were valuable as marking—first, the site of the old castle; second, the site of a church erected in 1720, which was afterwards pulled down; and, third, the site of the present church. As regards the view from the river, he said the tower and spire formed a magnificent contrast with the very fine building of the White Star Line Company at the bottom of James-street. As to the design, there was nobody in that room who would agree that it was a poor bit of architecture. The design, considering the time when it was erected—1820—was very good. He was perfectly certain that if the tower and spire were removed the loss would be felt by most Liverpool people.

Mr. Robert Fowler (artist), in seconding, endorsed the remarks of Professor Simpson.

The resolution was carried with unanimity.

Mr. Henry Peet (Historic Society of Lancashire and Cheshire) proposed:—"That the Finance Committee be respectfully requested to recommend the City Council to rescind their resolution of April 5 with reference to the demolition of St. George's Church tower and spire."

Mr. Henry Hartley, architect, in seconding, said it had been officially ascertained beyond doubt that the tower and spire would stand safely after the body of the church had been removed. If it were removed, he as a citizen of Liverpool, as well as an architect, would

* Next week we shall devote a further article to the Exhibition.

feel that there had been something removed from his life, and Liverpool would no longer be to him, looking from the Cheshire side and from the river, the same Liverpool that it had been in the past. Liverpool was commercial. If the tower and spire were removed, looking at the town from the river, they would see the commercial side, but would lose all the poetry the tower and spire imparted to the city.

The resolution was passed.

[The above is abbreviated from a report which appeared in the Liverpool *Daily Post*. We hope the opinions expressed will have their effect. To remove the tower which is the central architectural object at the end of the principal street of Liverpool would be as great a mistake as to remove St. Mary-le-Strand in London—more could not be said.]

ARCHITECTURAL SOCIETIES.

GLASGOW INSTITUTE OF ARCHITECTS.—A special meeting of the Council of this Institute was held on the 24th inst. in the chambers of the secretary, Mr. C. J. MacLean, 115, St. Vincent-street, under the chairmanship of Mr. David Barclay, President. The President explained that this meeting had been called to consider the principle of the Bill recently introduced into the House of Lords by Lord Russell of Killowen relating to illicit commissions. The President stated that one of the objects of the Institute is to insure that the business carried on by its members shall be free from anything dishonourable, and that they welcomed any action, through such a Bill or by any other means, which would insure fair trading in business and honourable dealing amongst all professional men. By Article 10 of the Articles of Association of this Institute every member is required as soon as possible after his election to sign a declaration that he will not have any interest in any trade contract for work which it is his duty to superintend or pass; nor will he receive or accept any pecuniary consideration or emolument from any measurer or tradesman working for a client under his supervision; but shall in every case receive payment for all professional services from his client direct, and not otherwise. It would seem, however, from the comments on Lord Russell's Bill which have appeared in some of the public prints that this is not fully understood, and that architects, along with others, are assumed to be commonly in receipt of such double commissions. He believed that the profession in Scotland was singularly free from this taint. The following resolution was then unanimously passed:—"That the Council of the Glasgow Institute of Architects, in the interests of honest trade, and to show its disapproval of illicit commissions, in whatever form, resolves to support the principle of Lord Russell's Bill, and that this resolution be communicated to the Royal Institute of British Architects, and that this Council expresses its willingness to support that body in any similar action it may take in favour of the principle of the Bill."

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The tenth meeting of the session of this Association was held on the 19th inst., Mr. T. Blashill, hon. treasurer, in the chair. The hon. secretary, Mr. Patrick, announced that the Congress would be held at Buxton from July 17 to 22. Mr. Dack, of Peterborough, read a paper on "Old Peterborough Customs and their Survival." He said that Peterborough had, perhaps, more curious old customs still surviving than any other city in England. The curfew bell was still rung at Peterborough, and the Cathedral was thought to be the only one where the old and correct order of processions was properly formed. Until about thirty-five years ago a sedan chair was in constant use to carry old ladies to church, concert, or party. The chairman belonged to a family who had been chairmen for many generations. The Rev. H. J. D. Astley, hon. secretary, read a paper by Miss Russell on "Some recent observations on the vitrified forts and drystone brochs in the north of Scotland and elsewhere." The paper elicited considerable discussion, the Chairman remarking that it was not the first time that the subject of vitrified forts had been brought before the Association, but more evidence of the vitrification was required. Mr. Gould remarked that they were not necessarily to be taken as early work. In several instances pieces of Roman tile had been found in their construction.

GLASGOW ARCHÆOLOGICAL SOCIETY.—The monthly meeting of the Glasgow Archæological Society was held at 207, Bath-street, on the 20th inst., when Mr. P. MacGregor Chalmers read a paper on "The Early Fabric of Glasgow Cathedral, with Notes of Recent Excavations." A short historical sketch of the early structures was given. The church—the choir only—founded by Prince David, was described as being necessarily in the Norman style, of the type of Dunfermline Abbey, or of much of the work at Durham. This choir must have been destroyed at an early date, since there is evidence that a second choir was erected in the time of Bishop Ingeham (1164-1174). Of this fabric an interesting fragment remains in the old wall shaft in the lower church, marking doubtless one of the angles of the apse of this early south aisle. To this choir Bishop Joceline began to add a nave. Wynton says he enlarged the church in 1181. As the choir was again destroyed this work was interrupted. Of Bishop Joceline's restoration a great deal more remains than is currently supposed. The north wall of the north aisle, the lower part of the north and south transepts, the general arrangement of the present vaulted landings leading to the aisles of the upper church, and almost the entire south aisle of the lower church, with its walls and vaulting, are of this period. This part of the description was assisted by a series of large drawings of all the mouldings. The object of the recent search under the floor of the cathedral, which was undertaken by permission granted by the Government, was to determine if any part of the ancient foundations had been allowed to remain. As a preliminary to this description, Mr. Chalmers indicated the results of a similar search at Jedburgh Abbey carried out by him some time ago by permission of the Marquis of Lothian. At Glasgow the search went to prove that all the old foundations had been removed. It was doubtless found necessary to do this owing to the method adopted for the foundation of the present cathedral. It was found that the pillars are not carried down below the pavement level as pillars. A great wall, about 8 ft. thick, seems to run continuously the whole length of choir, from east to west. It goes down a great depth, and reaches, at the top, to within 9 in. of the floor. The four pillars of the shrine are also founded upon a four-square wall. One of the other interesting discoveries was the finding of two of the original glazed red brick floor-tiles. These were exhibited at the meeting, and were compared with almost identical tiles found at Glenluce Abbey, which Mr. Chalmers is at present engaged repairing. A series of interesting photographs were shown. These included one of the painted panels on the vaulting of the church. The last photographs shown were several of the remarkably beautiful carved bosses in the lower church, each carved with a beautiful face, undoubtedly portraits. Professor Young next read a paper on "Collection of Medical Receipts by (a) the last Abbot of Westminster, (b) a Rector of Minchinhampton, (c) the Pastor of Westbury, Wilts." Mr. J. T. T. Brown, writer, read a paper, written by Mr. George W. Campbell, entitled "The Seals of Glasgow University."—*Glasgow Herald.*

COMPETITIONS.

FORMBY SEWERAGE SCHEME.—The author of the scheme placed first by the assessor is Mr. C. A. Atkinson, C.E., Liverpool. The estimated cost is 32,000*l.*

NEW VAGRANT WARDS, HEXHAM.—The Guardians have adopted the plans by Mr. T. Leslie Anderson, of Newcastle-upon-Tyne, submitted under the motto "Arcadia." The author has been awarded the premium of 20*l.*, subject to the approval of the Local Government Board, and on condition that the contractor will carry out the work for 2,000*l.*

THE ST. PANCRAS BATHS COMPETITION.—At a meeting of the St. Pancras Vestry, on Wednesday, Mr. G. Blount brought forward, on behalf of the Baths Committee, the report of Mr. A. Hessell Tiltman, F.R.I.B.A., the assessor who was appointed some time ago to advise the Vestry as to the relative merits of the designs for the new baths received from the six architects selected by the Vestry to compete. After giving a detailed criticism of each design, the assessor stated that, apart from the general disqualification of all the plans upon the point of cost, he was of opinion that the two designs Nos. 1 and 5 best met the requirements as set out in the instructions, and that of the two he gave the preference to No. 5. Mr. Tiltman pointed out that either design would require modification, the chief object of which would be to reduce the cost to within the limit of the 50,000*l.* mentioned in the instructions to competitors. After a long discussion the Vestry decided to adopt design No. 5, and to ask the author to make such modifications in his plans as would bring the cost of the buildings within the 50,000*l.* limit, and to make such other alterations as the Vestry might consider to be desirable. It was also resolved to retain Mr. Tiltman for the purpose of advising as to the modifications. On the envelopes being opened it was found that the authors of the six designs were as follows:—No. 1 design, Messrs. E. Harnor & F. Pinches (assessor's estimate of cost), 63,350*l.*; No. 2 design, Spalding & Cross, 58,850*l.*; No. 3 design, Francis J. Smith, 58,340*l.*; No. 4 design, R. Stephen Ayling, 60,812*l.*; No. 5, Thomas W. Aldwinckle (selected), 63,550*l.*; No. 6, E. l'Anson & Son, 62,387*l.*

THE LONDON COUNTY COUNCIL.

THE first meeting of the London County Council after the Easter recess was held on Tuesday in the County Hall, Spring Gardens, Lord Welby, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was ageed to lend the Greenwich District Board 16,255*l.* for paving works, the Hammersmith Vestry 4,820*l.* for electric lighting purposes, the Lewisham District Board 3,785*l.* for street improvements, &c., the Newington Vestry 10,000*l.* for paving works, the Battersea Vestry 8,540*l.* for purchase of land for electric lighting purposes, the Plumstead Vestry 4,200*l.* for purchase of site for offices, and the St. Pancras Guardians 2,000*l.* for alterations and additions to schools.

Rotherhithe Tunnel.—The greater part of the sitting was occupied in considering a report of the Bridge's Committee in reference to a proposed Thames Tunnel at Rotherhithe. They submitted the following scheme:—

"The open approach to the tunnel is to commence on the south side of the river at the junction of Union-road with Lower-road, direct access to the open approach being provided not only from the main thoroughfare but also from Neptune-street, Albion-street, and Adam-street by means of a paved area formed to gradients leading down to the end of the open approach. The open approach will be constructed along Adam-street, and will cross over the East London Railway by a bridge at Rotherhithe station, access to which from the open approach can be provided by a subway passing under Adam-street. The cut-and-cover portion of the tunnel will extend from the East London Railway to a point near Dodd's-place, where the first shaft will be situated and the actual tunnel construction will commence, and will continue under the Antimony Works and the South Metropolitan Gas Company's premises to the second shaft near the Surrey Lock entrance of the Surrey Commercial Docks. From this point the tunnel will pass under the river to the third shaft, which it is proposed to sink on premises immediately to the west of Shadwell Fish Market. From the third shaft the tunnel will proceed, partly on a curve and partly on a straight line, to the fourth, which it is proposed to place on the north side of Broad-street, just to the east of Collingwood-street. At this shaft the cut-and-cover construction will commence and extend along parallel to Broad-street as far as Butcher-row, at which point the open approach would commence and be continued by a curve to join Horseferry Branch-road, the gradient of which being the same as that required for the tunnel approach, the northern portion of this road would really form part of the approach.

The span of the bridge carrying the Blackwall Railway over Horseferry Branch-road, which is now 40 ft., would have to be increased so as to provide convenient access between the tunnel and Commercial-road East.

The total length of the tunnel and approaches from Union-road on the south, to Commercial-road East on the north, will be 6,825 ft., or about 1¼ miles, or very little more than the length of Blackwell Tunnel, from East India Dock-road to the entrance gateway at Blackwall-lane, and in connexion with this question of length it should be pointed out that whereas in the case of the Blackwall Tunnel the length between the main thoroughfares on both sides of the river, viz., between the East India Dock-road on the north of the Thames and the Lower Woolwich-road or Trafalgar-road on the south is two miles, the length

between the main thoroughfares in the scheme now under consideration is only 1¼ miles.

The Blackwall Tunnel only taps a fully populated district on the north side of the river, but the proposed Rotherhithe Tunnel will tap fully populated districts, and districts which are large business and commercial centres, on both sides of the river. It is therefore quite reasonable to expect that the amount of traffic which will pass through the Rotherhithe Tunnel, if it is constructed, will very largely exceed that which now passes, or even for some years to come will pass, through the Blackwall Tunnel.

As regards gradients the Rotherhithe Tunnel will have on the south side about 1,828 ft. of 1 in 34 and about 475 ft. of 1 in 50, and on the north side about 2,260 ft. of 1 in 34. These distances refer to the tunnel and approaches between the entrance houses. Between the entrance house on the north side of the river and Commercial-road East will be a length of 489 ft. with a gradient of 1 in 34, and between the entrance house on the south side and Union-road will be a length of 105 ft. also with a gradient of 1 in 34. The tunnel under the river will be horizontal for a length of 1,028 ft., and have a gradient of 1 in 75 for a length of 640 ft. The Blackwall Tunnel gradients are as follows:—2,409 ft. of 1 in 36 on the south side, and 2,569 ft. of 1 in 34 on the north side, the tunnel under the river being horizontal for a length of 1,222 ft. The actual descent in passing from the north side through the tunnel will be 89 ft., as compared with 75 ft. 6 in. in the case of the Blackwall Tunnel from the north side of the river.

The width of thoroughfares proposed in the Rotherhithe Tunnel are 17 ft. for the carriageway and 4 ft. 2 in. for each footway, as compared with 16 ft. and 3 ft. 1½ in. respectively for the Blackwall Tunnel.

The headways proposed will be 18 ft. 6 in. at the centre of the carriageway, and 15 ft. 7 in. at the channels, as compared with 17 ft. 6 in. and 14 ft. 7 in. respectively for the Blackwall Tunnel.

It will be seen from these figures that the accommodation for traffic in the Rotherhithe Tunnel will be decidedly superior to that in the Blackwall Tunnel.

In order to obtain this improved accommodation it is necessary to make the outside of the proposed tunnel 30 ft. in diameter, or 3 ft. larger than the outside diameter of the Blackwall Tunnel.

It is proposed to have stairways at each of the four shafts in addition to stairways at the commencement of the cut-and-cover on each side of the river.

On the north side of the river, Broad-street, Medland-street, and Butcher-row will be widened, and London-street and Rose-lane will be affected.

As regards the difficulties likely to be encountered in the execution of the tunnel, we think, from the information obtained as to strata, that under the river and on the north side there will probably be less difficulty than in the case of the Blackwall Tunnel, but there may be difficulties as regards water in constructing the deep cut-and-cover portion on the south side of the river.

The approximate estimate of the cost of the works involved by the scheme is 1,400,000*l.*

With regard to the acquisition of property, we have ascertained that the estimated cost is 798,250*l.* This sum will include the cost of acquiring sites for the re-housing of those persons of the working classes who may be displaced by the carrying out of the scheme. In compliance with the standing order, we are in communication with the Finance Committee, who will in due course report their views on the financial bearings of the project. We recommend—

(*a*) That a tunnel be constructed to connect the districts of Rotherhithe and Shadwell, at an approximate cost of 2,198,250*l.*

(*b*) That application be made in the next session of Parliament for power to carry out the work, and that the Parliamentary Committee be instructed to take the necessary steps for that purpose."

Alderman Beachcroft moved a long amendment, asking for information on several points concerning the Metropolitan bridges, the Woolwich Ferry, and the Blackwall Tunnel. Colonel Hughes, M.P., seconded the amendment. He said they were going too fast in these matters. The Blackwall Tunnel was not a success, and it was fated to be used as a railway or a tramway like the original Thames Tunnel. People would not walk for more than a mile underground. The amendment, on a division, was rejected by 68 votes to 31, and the recommendation was carried by 69 votes to 29.

Tower Bridge Southern Approach.—The Improvements Committee recommended, and it was agreed, that the working drawings, specification, and estimate of the cost (5,655*l.*) of the paving and other works in connexion with the portion of the new Tower Bridge southern approach between Artillery-street and Tooley-street be referred to the manager of the Works Department, with a view to the work being carried out without the intervention of a contractor.

Lower Thames-street Improvement.—The same Committee, with reference to the proposed widening of Lower Thames-street in the interests of the Fish and Fruit Markets, proposed: "That the estimate of 50,000*l.* submitted by the Finance Committee be approved, and that the Council do contribute, on the usual conditions, one-fourth of the net cost of the widening of Lower Thames-street to 60 ft. between Botolph-lane and Fish-street Hill, as shown upon the plan submitted by the City Corporation, such contribution not to exceed the sum of 50,000*l.*" A motion to refer the matter back for further consideration was defeated on a division by 66 votes to 26, and the recommendation was then carried.

Clearances at Waterloo Station.—Some points were raised by Lieutenant-Colonel Ford with reference to the clearance of dwellings proposed to be made at Waterloo Station by the London and South-Western Railway Company. The Parliamentary Committee of the Council reported that they were at present negotiating with the company with a view to the company constructing a new street, and providing proper accommodation for rehousing persons of the labouring classes who may be displaced by the proposed extension of the station.

Mr. Cornwall, the chairman of the committee, said they were in full sympathy with the points raised as to rehousing, and hoped to carry the negotiations to a successful issue.

Safety of the Guildhall.—It is proposed to hold a masque at the Guildhall on certain days in June next in connexion with the Art Workers' Guild, and the Lord Chamberlain is prepared to grant a licence for the performance provided that the Council inform him that they consider the premises safe for the purpose. The Theatres and Music Halls Committee of the Council reported that they considered the premises "reasonably safe," provided that precautions to the number of nineteen are observed, and they recommend that the Lord Chamberlain be so informed.

Sir Joseph Dimsdale regretted the number of restrictions that were imposed, and that the number of persons to be admitted was to be only 500, whereas the hall would seat 1,000.

In the course of the discussion it was pointed out that the first report of the Architect was entirely adverse to granting the licence, and all the precautions required were necessary as a protection against fire. It was said by Sir Algernon West that it was a building most difficult to escape from in case of fire.

The recommendation of the Committee was adopted.

Repairs, &c., to Fire Station.—The Fire Brigade Committee reported, and it was agreed, (1) That the tender of Mr. C. F. Kearley to execute for 555*l.* the work of painting, repair, alteration, and drainage in the old part of the Battersea Station be accepted. (2) That the Council do sanction an expenditure of 230*l.* for repairs, painting, and pointing, at the Greenwich Station; that the work be carried out by the Council without the intervention of a contractor; and that the specification, quantities, and estimate be referred to the manager of works for that purpose.

Iron and Glass Shelter, Coburg Hotel, Carlos-place, W.—The Building Act Committee reported as follows, the recommendation being agreed to:—

St. George, Hanover-square.—In this case proceedings were taken against the Coburg Hotel, Limited, for erecting an iron and glass portico to the porch at the entrance to the Coburg Hotel in Carlos-place and beyond the general line of buildings, notwithstanding the fact that the Council refused to give its consent. For the defence it was contended that the portico was not a structure within the meaning of Section 22 of the London Building Act, 1894, and that as it projected over the public way, both the local authority and the police had power to take proceedings under other statutes, but had not done so. It was further contended that if the magistrate was of opinion that the portico was a structure within Section 22, then the case came within the proviso contained in that section as being upon land lawfully occupied by a building or structure. The magistrate decided that the portico was a structure within the meaning of Section 22, and that the case did not come within proviso to that section, nor did the portico come within the statutes under which either the Local Authority or the police could take proceedings, and he imposed a penalty of 2*l.* with five guineas costs to the Council. The magistrate also made an order for the demolition of the structure. On the application of the defendant, however, the magistrate consented to state a case for the opinion of the High Court upon the point raised. We think the Council should take steps to uphold the magistrate's decision. We recommend—That the solicitor do take the necessary steps for upholding before the High Court the decision of the magistrate in the proceedings taken by the Council with reference to the iron and glass shelter, erected at the Coburg Hotel, Carlos-place.

Leighton & Millais Buildings, Millbank Estate.—The Housing of the Working Classes Committee reported, and it was agreed, that standing order No. 195 be suspended, so that payments up to 80 per cent. of the value of the work executed may be made in respect of the erection of Leighton and Millais buildings, Millbank Estate; and that the amended tender of Messrs. Holloway Brothers, amounting to 12,380*l.* for the erection of the buildings be accepted.

The Council adjourned soon after seven o'clock.

METROPOLITAN ASYLUMS BOARD.

THE fortnightly meeting of the Managers of the Metropolitan Asylums District, was held on Saturday at the County Hall, Spring Gardens, Mr. R. M. Hemsley presiding.

The Northern Hospital.—The Works Committee reported that they had invited tenders for the erection of an engine-house and chimney-shaft for the electric lighting installation at the Northern Hospital. The lowest tender was 2,795*l.*, from Mr. J. Appleby, of Cornwall-road, S.E., and there were five others, ranging up to 3,470*l.* The lowest tender being largely in excess of the architects' estimate (1,700*l.*—made on February 1 last—and subsequently increased to 2,000*l.*), they had inquired further into the matter, and had no doubt that the discrepancy was due to the fact that the architects, Messrs. Pennington & Son, greatly under-estimated the cost. Mr. Appleby had consented to certain modifications in the specification and quantities whereby the cost of the work would be reduced from 2,795*l.* to 2,620*l.*, and the Committee recommended that the revised tender should be accepted. Mr. Will Crooks, L.C.C., denounced the practice of cutting down the work because the architects' estimate had been too low. The work was undertaken on the representation of the architect that it would cost a certain sum, and then they found the cost would be considerably greater. Of course, Messrs. Pennington would be paid commission on the tender. It seemed to him a very nice way of making money. Mr. Edward White, L.C.C., said the work had been cubed out at a shilling a foot, which was too low for the class of work. The Committee had considered the builder's estimate and thought it exceedingly moderate, but there were a few items which could be omitted without injury to the buildings. It did not do to place too much reliance on a cube estimate. Mr. Purchese, L.C.C., said these architects had done some of their best work, but they did not seem to have looked into this matter very carefully. The Committee had gone very thoroughly into the cost of electricity, and had come to the conclusion that the cost would be less than that of gas. This excess of over 50 per cent. altered the whole position. They did not pay professional men 5 per cent. to write down imaginary prices. Mr. Helby said Mr. Purchese had let out the secret. The Committee wanted to make out that electricity would be cheaper and that accounted for the 1,700*l.* Now that the tenders came in there was an access of 65 per cent. After further discussion the Committee's proposal was adopted.

THE BUILDING TRADE DISPUTE.

THERE is little to report this week as to the lock-out of the plasterers. Attempts are being made by the masters, we believe, and with some success, we understand, to carry on plastering work without the assistance of union men; but there are no indications of an immediate settlement of the dispute. Some of the masters in the North and the Midlands are inclined to favour a general lock-out in the building trade; but it is not likely that this will take place—at all events, at present.

HYDE PARK COURT, ALBERT GATE, S.W.—In reference to the paragraph in last week's issue under this heading, Mr. Francis Hooper requests us to state that the late firm of Messrs. Archer & Green, Buckingham-street, Strand, were the original architects of these buildings, and that only after the dissolution of the partnership in 1889 was Mr. Hooper associated with Mr. Thomas Archer in the work.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

AT the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.*

Formation of Streets—Manor Park Estate.

Lewisham.—That the sanction of the Council be given to the construction, in connexion with the formation of new streets on the Manor Park Estate, Lee and Lewisham, of the proposed bridges intended to carry public roads over the river Quaggy (Mr. A. W. Osborn for Messrs. Johnson & Aldridge).—Agreed.

Artisans' Dwellings.

Hammersmith.—The erection, under Section 42 of the London Building Act, 1894, of four blocks of artisans' dwellings on land on the east side of Fulham Palace-road, Hammersmith (Messrs. N. S. Joseph, Son, & Smithem, for the trustees of the Guinness Trust).—Refused.

Lines of Frontage.

Islington, East.—That permission be given to Mr. A. Mills to retain a projection (an illuminated sign) at the "Myddleton Arms" public-house, No. 52, Canonbury-road, Islington, extending beyond the general line of buildings in Canonbury-grove, on condition that he do remove such sign at the expiration of one year from April 25, 1899.—Agreed.

Kensington, North.—That permission be given to Mr. C. W. Treadaway to retain a projection (an illuminated sign) at the "Sun in Splendour" public-house, Portobello-road, Notting Hill, extending beyond the general line of buildings in that street, on condition that he do remove such sign at the expiration of one year from April 25, 1899.—Agreed.

Chelsea.—Inclosed porches, bay windows, and balconies to two blocks of residential flats on the north-east side of Franklin's-row, Chelsea, between Turk's-row and Pimlico-road (Mr. P. Hoffmann for Mr. J. D. Mackenzie).—Consent.

Greenwich.—One-story shops upon part of the forecourts of Nos. 68, 70, 72, 74, 76, 78, 80, and 82, Blackwall-lane (formerly Marsh-lane), East Greenwich (Mr. H. Busbridge for Mr. W. Busbridge).—Consent.

Islington, North.—A one-story building on the west side of Stroud Green-road, Islington, between Nos. 101 and 109 (Messrs. Edmeston & Gabriel for the Aylesbury Dairy Company).—Consent.

Islington, North.—Four-story bay-windows to three blocks of residential flats proposed to be erected on the south side of Pemberton-gardens, St. John's Park, Upper Holloway, (Mr. S. Perks for the Tuffnell and Caledonian Parks Syndicate).—Consent.

Lewisham.—A one-story building at the side of No. 20, Springbank-road, Hither Green, Lewisham (Mr. E. T. Hedges for Mr. Packer).—Consent.

Norwood.—An addition in front of the British Home for Incurables, Crown-lane, Streatham (Mr. E. T. Hall for the Board of Management of the British Home for Incurables).—Consent.

Rotherhithe.—A one-story shop upon part of the forecourt of No. 205, Southwark Park-road, Bermondsey (Mr. M. L. Saunders for Mr. R. O. Friend).—Consent.

Bow and Bromley.—An iron and glass illuminated sign at the "King's Arms" public-house, 167, Bow-road, Bow (Mr. J. G. Needham for Mr. E. Morton).—Refused.

Battersea.—Two one-story shops on the east side of Queen's-road, Battersea, adjoining the London, Brighton, and South Coast Railway (Mr. H. Bignold for Mr. W. Peacock).—Refused.

Brixton.—A one-story shop in front of No. 166, Ferndale-road, Brixton (Mr. R. Bawden for Mr. J. Arnold).—Refused.

City of London.—An iron and glass shelter at the entrance to the Holborn-viaduct Hotel, Holborn-viaduct (Messrs. Spiers & Pond, Limited).—Refused.

Hammersmith.—One-story shops in front of Nos. 54 and 56, Uxbridge-road, Shepherd's Bush (Mr. G. H. Fox for Messrs. C. Rawley, Cross, & Co.).—Refused.

Hampstead.—That Messrs. Lee, Bolton, & Lee be informed that the Council cannot entertain their request for compensation in respect of the land required to be dedicated to the use of the public by the terms of the Council's consent to the erection of houses with shops on the west side of South-end-road, Hampstead, and also the erection of houses, with bay-windows, on the south side of John-street (for Mr. F. T. Binnington).—Agreed.

Hampstead.†—A block of residential flats on the northern side of Finchley-road, at the corner of West Hampstead-avenue (Mr. J. Reynolds).—Refused.

Kensington, South.†—A two-story bay-window in front of No. 68, Bedford-gardens, Kensington (Mr. W. H. Parkinson for Miss Baillie).—Refused.

Lewisham.—Five houses with one-story shops on the west side of High-street, Lewisham, at the corner of Albacore-crescent (Messrs. Phillips, Norfolk, & Prior for Mr. H. F. Harrington).—Refused.

Norwood.—Houses with shops on the west side of Norwood-road, West Norwood, between Ullswater-street and Harpenden-street (Mr. F. A. Powell for Mr. A. G. Rose).—Refused.

Wandsworth.†—One-story shops on part of the forecourts of Nos. 15, 17, 19, and 21, East Hill, Wandsworth (Mr. T. J. Lynes).—Refused.

Westminster.—A three-story oriel window at No. 26, New Tothill-street, Westminster, at the corner of Dacre-street (Mr. P. Hoffmann for Mr. C. M. Owen).—Refused.

Width of Way.

City of London.—Offices, with projecting piers and oriel windows, on a site abutting on Moorgate-street, King's Arms Yard and Coleman-street (Messrs. Gordon, Lowther, & Gunton for Mr. C. Morrison).—Consent.

City of London.—Buildings on the site of Nos. 18 and 19, Whitefriars-street, City, and premises at the rear abutting upon George-yard and Ashen Tree-court (Messrs. A. Billing, Son & Rowley for Mr. W. Downs).—Consent.

Hoxton.—A block of dwellings on the north side of Red Lion-court, Hoxton-street, Shoreditch (Messrs. Lewcock & Callcott for Mr. S. Mead).—Consent.

St. Pancras, North.—Rebuilding of the "Vine Hotel, Highgate-road, St. Pancras, at less than the prescribed distance from the centre of a public footway leading from Highgate-road to College-lane (Messrs. Cubitt & Collinson for Mr. E. Tabernacle).—Consent.

Westminster.—A one-story addition at the rear of the "Regent Arms" public-house, No. 53, Regency-street, Westminster, at less than the prescribed distance from the centre of Vincent-street (Mr. H. W. Budd for Mr. Low).—Consent.

Southwark, West.—An addition to the "Prince of Wales" public-house, St. George's-road, Southwark, at less than the prescribed distance from the centre of Hayles-street (Messrs. Waring & Nicholson for the trustees of the Lambeth Hayles Charity Estate.—Refused.

Bow and Bromley.—Two buildings, to be used respectively as a bakery and warehouse, on the east side of Fawe-street, Morris-road, Bromley-by-Bow (Mr. Max Clarke for Spratts Patent, Limited).—Refused.

Islington, West.—A factory on the west side of Eden-place, Eden-grove, Holloway (Messrs. Kingsford, Dorman, & Co., for the Star Brush Company, Limited).—Refused.

Space at Rear.

Hammersmith.—The extension above the diagonal line mentioned in Section 41 of the London Building Act, 1894, of a portion of a block of residential flats on the north side of Addison Court-gardens, Blythe-road, Hammersmith (Mr. R. J. Worley).—Refused.

Deviation from Certified Plan.

Lambeth, North.—Deviations from the plan certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of Nos. 124 and 126, Oakley-street, Westminster Bridge-road, Lambeth (Messrs. Stock, Page, & Stock for Mr. Seth Taylor).—Consent.

Line of Fronts and Width of Way.

St. Pancras, South.—A theatre building on the south side of Euston-road, with two iron and glass shelters to abut respectively upon Euston-road and Tonbridge-street (Messrs. Wylson & Long for the proprietors of the Euston Theatre).—Consent.

Lines of Frontage and Construction of Buildings.

Strand.—The retention of a temporary iron and glass porch at the buffet entrance to the Adelphi Hotel, John-street, Adelphi (Mr. W. Emden for Mr. F. Evans).—Consent.

Islington, East.—That Mr. J. Webster be informed that the Council is not prepared to accede to his request for its consent in respect of wooden name boards erected on top of the open pale fence and party fence walls enclosing the forecourt of Nos. 4, 5, 6, 7, 8, 9, and 10, Kingsland-green, Dalston.—Agreed.

Rotherhithe.—Two iron gangways across Church-passage, Rotherhithe, at the second and third floor levels of Messrs. Dudin's warehouses on each side of that street (Messrs. W. A. Crips & Sons, for Messrs. Dudin & Sons).—Consent.

Norwood.†—A temporary wood and iron chapel with projecting porch, on a piece of land adjoining No. 71, Gipsy-road, Norwood (Mr. Harbrow, for the Rev. W. Hobbs).—Refused.

Lines of Frontage and Space at Rear.

Hackney, South.—A bakehouse with loft over at the rear of No. 71, Chatsworth-road, Clapton, to abut upon Blurton-road (Mr. H. Dearsley, for Mr. H. Lunken).—Consent.

St. George, Hanover-square.—That, under the provisions of Section 73 of the London Building Act, 1894, the consent of the Council be given to the erection of a three-story dwelling-house with porch and two-story bay windows, on a portion of the site of No. 1, Belgrave-square, St. George, Hanover-square, fronting on Wilton-crescent, and that the Council, under the provisions of Section 207 of that Act, do also consent to the alteration of No. 1, Belgrave-square (Mr. P. A. Todd, for Mr. W. Tebb).—Agreed.

Wandsworth.—That the Council, under Section 22 of the London Building Act, 1894, do not consent to the frontage of six shops with one story over, on the east side of Lower Richmond-road, Putney, near River-street, and that the Council, under Section 41 of that Act, do not permit the erection of such buildings (Mr. H. Bignold, for Mr. Temple).—Agreed.

Width of Way and Cubical Extent.

Whitechapel.—That the Council, in the exercise of its powers under Section 13 of the London Building Act, 1894, do consent to the erection of one-story offices, &c., on the west side of an ale-store at Albion Brewery, Brady-street, Whitechapel, to abut upon Bath-street, at less than the prescribed distance from the centre of the roadway, and that, subject to the provisions of Section 76 of that Act, 1894, the Council do consent to the erection of the proposed one-story offices, &c., and of an extension of a torrifying house, whereby the northern division of the ale-store will exceed in extent 250,000, but not 450,000, cubic feet (Mr. R. Spence, for Messrs. Mann, Crossman, & Paulin).—Agreed.

Width of Way and Deviation from Certified Plans.

Hackney, South.†—That the consent of the Council be not given, under Section 13 of the London Building Act, 1894, to the re-building of No. 21, High-street, Homerton, at the corner of Plough-lane, and that the sanction of the Council be not given to certain deviations from the plans certified by the district surveyor under Section 43 of that Act (Mr. I. Mason, for Mrs. C. Rix).—Agreed.

Width of Way and Construction of Buildings.

Bermondsey.—A wood and iron roof over the existing one-story timber stage and office adjoining in the yard at the rear of No. 21, Old Kent-road, abutting on Ackworth-street (Messrs. Battley, Sons, & Holness).—Refused.

Hoxton.—That Mr. A. L. Crawford be informed that the Council is not prepared to accede to his request for the Council's licence in respect of a wooden building or structure on the south side of Britannia-gardens, Hoxton.—Agreed.

Formation of Streets.

Wandsworth.—That an order be issued to Mr. W. H. Collier, sanctioning the formation or laying out of new streets for carriage traffic on the Durnsford Park Estate, Merton-road, Wandsworth, and in connexion therewith the widening of a portion of Merton-road (for Messrs. A. and J. Wise and signed by the Chairman of the Building Act Committee). That the names Strathville-road, Penwith-road, Acuba-street, and Ravensbury-road be approved for the new streets.—Agreed.

Whitechapel.—That an order be issued to Messrs. D. Cubitt, Nichols, Sons, & Chuter, sanctioning the formation or laying out of three new streets for carriage traffic out of the east side of Middlesex-street (formerly Sandys-row), Spitalfields (Sir Algernon K. B. Osborn, Bart.). That the names Tripe-street, Cobb-street and Short-street be approved for the new streets.—Agreed.

Lewisham.—That an order be issued to Mr. G. F. Logsdail, sanctioning the formation or laying out of new streets for carriage traffic on a portion of the St. Germain's Estate, Hither-green, Lewisham, and in connexion therewith, the widening of a portion of Hither-green-lane (for Mr. A. Cameron Corbett, M.P.). That the names Torridon-road (in continuation), Ardgowan-road (in continuation), Minard-road (in continuation), Broadfield-road (in continuation), Wellmeadow-road (in continuation), Hazelbank-road, Hafton-road, Killearn-road, and Dowanhill-road be approved for the new streets.—Agreed.

Woolwich.—That Mr. J. O. Cook be informed, in reply to his letter asking for reconsideration of the Council's decision with regard to his application for sanction to the formation or laying out for carriage traffic of a new street to lead out of the south side of Nightingale-place, Woolwich Common, and the widening of a part of Nightingale-lane, that the Council is not prepared to accede to his request; and that the Woolwich Local Board be informed with reference to their letter on the subject that the Council is not prepared to sanction the proposed street of a less width than 40 ft.—Agreed.

Lewisham.—That an order be issued to Mr. D. Watney, refusing to sanction the formation or laying out for carriage traffic of two new streets upon the Belmont Estate, Belmont-hill, Lee, and in connexion therewith the widening of a portion of Belmont-road (for the Mercers' Company).—Agreed.

Wandsworth.—That an order be issued to Messrs. Lee & Pain refusing to sanction the formation or laying out for carriage traffic of a new street to lead from High-street to Cooper's-arms-lane, Putney, and, in connexion therewith, the widening of a portion of Cooper's-arms-lane (Mr. R. J. Pettiward).—Agreed.

* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.

Artisans' Dwellings.

St. Pancras, East.—That the Council do make an order as follows:—Whereas Mr. O. Fleming, of No. 17, Pall Mall East, London, acting on behalf of the London County Council, on March 25, 1899, under the provisions of Section 42 of the London Building Act, 1894, delivered at the County Hall a plan of three blocks of intended dwelling houses, to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a site at the rear of houses on the north side of Grafton-place and the south side of Lancing-street, Somers Town, St. Pancras. . . . . The Council, in the exercise of its powers under Section 42 of the said Act . . . . does by this order sanction the said plan.—Agreed.

Building for the Supply of Electricity.

Bow and Bromley.—That the Council do approve of the plans (Mr. O. E. Winter for the Board of Works for the Poplar District) for the construction of an electric lighting station and works on a site at the corner of Glaucus-street and Yeo-street, Bromley.—Agreed.

The recommendations marked † are contrary to the views of the Local Authorities.

FACTORY AND WORKSHOP ACTS, 1878 TO 1895.

AT the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following report, the consideration of which was adjourned:—

"By the provisions of the Factory and Workshop Acts, 1891 and 1895, the duty is imposed upon the Council of seeing that each London factory or workshop, in which more than forty persons are employed, is provided on the stories above the ground floor with such means of escape in case of fire for the persons employed therein, as can reasonably be required under the circumstances of each case. The powers thus conferred upon the Council are, in accordance with the standing orders, exercised by us; and applications are constantly being made for a statement of the Council's requirements in regard to the means of escape to be provided in the cases above referred to. It is, of course, quite impossible to draw up any absolute rules or regulations upon this subject, as each case must be dealt with upon its merits after full consideration of its circumstances, but we have prepared a general statement of requirements which we think will be of use in assisting factory owners in making applications for the Council's certificate or in submitting proposals to comply with the Council's requirements. A copy of the statement is appended to this report; and we recommend—'That the Council do approve the following statement prepared by the Building Act Committee with reference to the Council's requirements in respect of the means of escape from factories, workshops, &c., in accordance with the provisions of the Factory and Workshop Acts, 1878 to 1895.'"

I. *Provision of Means of Escape in Case of Fire.*

Applications, Plans, and Particulars.—Applications for the Council's certificate in respect of the means of escape from new buildings, and applications with proposals to meet the Council's requirements in respect of the means of escape from old buildings should state—

(*a*) The number of persons to be employed on the premises, specifying the number of males and females employed on each floor.

(*b*) The trade to be carried on on each floor, with particulars of machinery, power, &c.

(*c*) In the case of factories, whether the premises were erected before January, 1892, and, in the case of workshops, laundries, &c., whether erected before January, 1896.

(*d*) The name and address of the owner.

Applications should be accompanied by complete plans and sections drawn on the unglazed side of tracing linen to $\frac{1}{8}$-in. or $\frac{1}{4}$-in. scale ($\frac{1}{8}$-in. scale preferred), and a block-plan to a small scale showing the premises and the surrounding buildings and thoroughfares, such block-plan to have the north point indicated.

II.

Requirements as to Means of Escape.—The following statement of the requirements of the Council with respect to means of escape in case of fire is framed with a view to assisting owners in submitting proposals to comply with the Council's structural requirements under Section 7 of the Act of 1891. Such statement must not, however, be taken as binding upon the Council, but only as a general guide or indication, since each case is, after full consideration of the varying circumstances, dealt with upon its merits; and nothing herein contained must be taken as in any way interfering with or derogating from the powers of the Home Office, the Council, the District Surveyors, or of any other authority whatsoever under the Factory Acts, the London Building Acts or any other Act or under any by-laws or regulations relating to the construction of buildings or otherwise, or as constituting any consent, sanction, allowance or permission under any such act, by-law or regulation, but all such acts, by-laws and regulations must be fully observed and complied with notwithstanding anything herein contained.

Number of Staircases.—The number of staircases required depends, *inter alia*, upon the following circumstances:—

(*a*) The area of the building; (*b*) the number of persons employed or which could be employed; (*c*) the disposal of the workpeople; and (*d*) the alternative means of escape which may be available.

Alternative Means of Escape.—It may, however, be laid down as a general principle (subject to the exceptions hereafter mentioned) that distinct and separate alternative means of escape, exclusive of windows, loop-hole doors, &c., are required from each of the upper floors, either by means of—

(*a*) A second staircase in the same block; (*b*) a proper staircase in another block, to which access is available on all the upper floors by proper openings in the party or division walls, or by external communication; or (*c*) open iron bridges where the blocks are not adjoining each other.

Escape by Roof.—The means of escape from each of the upper floor levels should be placed as far apart as possible; and, in all cases where practicable, some means of escape from the roof of the building to the roof of adjoining premises should be provided.

Cases in which One Staircase may be Deemed Sufficient.—In small and inextensive premises, and in some cases where it is possible to provide a staircase in a central position, one properly inclosed staircase, constructed of incombustible materials, may be accepted; but in all cases where only one staircase is provided, some means of escape from the roof to the roof of adjoining premises *must* be provided.

III.—STAIRCASES.

The following are the general requirements of the Council with regard to the construction of internal staircases, &c.:—

(*a*) *Position.*—Staircases should be placed next to an outer wall, and must be so arranged as to deliver by means of a doorway, not less than 4 ft. 6 in. wide in the clear when the doors are open, direct into the outer air at the ground level into a public way or thoroughfare or some large open space. Staircases must be so arranged that persons enter the staircases from any floor level in the same direction as persons descending the staircases.

(*b*) *Lighting and Ventilation.* — They must be properly lighted and ventilated by windows.

(*c*) *Inclosing of Staircases.*—Staircases, including landings and passages from one flight to another, must be inclosed with newel and inclosing walls, not less than 9 in. thick, carried up above the roof and ceiled with iron and concrete.

(*d*) *Materials to be Used.*—They must be constructed of incombustible materials.

(*e*) *Steps, Flights, and Landings.*—The steps thereof must be solid square or spandrel, arranged in straight flights, without winders; each flight must consist of not more than twelve and not less than three steps, and the steps must be supported at both ends on brickwork, and the staircases must have landings at the top and bottom of each flight and between the flights. Such steps and landings are to be of the same width as the staircase (see (*i*) below) and not less than 6 in. thick.

(*f*) *Treads.*—The treads must not be less than 10 in. wide clear of nosings.

(*g*) *Risers.*—Risers must not be more than $7\frac{1}{2}$ in. high.

(*h*) *Handrails.*—Staircases must be provided with handrails fixed upon both sides thereof and continued round the landings, and chased into the ends of the newel walls.

(*i*) *Width of Staircases.*—The width of the staircases is to be regulated as follows:—

(*a*) Where the premises are adapted for the employment of less than 200 persons on the floors above the ground floor, the staircases must be not less than 3 ft. 6 in. wide.

(*b*) Where adapted for more than 200 persons on the floors above the ground floor or where more than 100 persons are employed on any one floor above the ground floor the staircases must not be less than 4 ft. 6 in. wide.

(*j*) *Doorways to Staircases.*—Staircases must in all cases be connected with all floors and the roof by means of doorways of the same width in the clear, when the doors are open, as the stairs.

(*k*) *Spandrel Steps.*—Spandrel steps where used must be of the following thickness—

(*a*) For 3 ft. 6 in. staircases, not less than 3 in. thick in the smallest part.

(*b*) For 4 ft. 6 in. staircases, not less than $4\frac{1}{2}$ in. thick in the smallest part.

(*l*) *Doors to Staircases.*—All doorways to staircases must be fitted with doors of fire-resisting materials (solid teak or oak 2 in. thick or other approved material) in two folds, hung so as to open in the direction of exit or to swing both ways clear of stairs, landings, passageways, and footways; such doors to be fitted with springs, weights, or other approved appliances to close them after use, and to be fastened by means of automatic bolts only, if fastenings be required, so that doors open by pressure from the inside.

IV

Construction of Staircases in certain "Old Buildings."—In the case of old buildings* (in respect of which the Council is not required to issue a certificate) where there is a distinct and separate alternative means of escape provided, to the satisfaction of the Council, from each of the upper floors, the enclosed staircase may be constructed of teak or oak, not less than 2 in. thick, including the treads, strings, carriages, bearers, landings, joists, and floors, the risers to be not less than 1 in. thick, but no fir or pine must be used; and the enclosure to the staircase may be a solid partition of incombustible material at least 3 in. thick; but such staircase must, in all other respects, be formed and arranged as required for a staircase for a new building as regards width, going, treads, risers, doors, handrails, &c. (see No. III.).

V.

External Iron Staircases.—In cases in which external iron staircases are accepted by the Council as means of escape, they must be constructed with dead bearings and without cantilever work.

They must comply with the requirements (above specified) for inclosed staircases as regards width, going, width of treads, height of risers, doors, handrails, &c.

They must deliver into the outer air at the ground level into a public way or thoroughfare, or some large open space.

Where an iron staircase is in general use the treads must be of approved non-slippery material (as distinguished from perforated iron or chequered iron plates).

All windows and similar openings by, or near, which such staircases pass must be protected with kiln wire, or glazed with a combination of glass and wire or other approved fireproof glazing.

VI.—ESCAPE BY ROOF.

Guard Rails on Roofs.—Proper guard rails must be provided to the routes of escape on roofs, &c., where necessary, to the satisfaction of the Council.

VII.—GANGWAYS.

Gangways.—Clear gangways, at least 3 ft. 6 in. wide, must be kept up to, and between, all staircases, bridges, and exits on all floors.

VIII.—EXIT DOORS.

Doors Usable as means of Exit.—All doors usable as means of exit must be made so as to open in the direction of exit, or to swing both ways clear of stairs, landings, passageways, &c.

Width of such Doorways, &c.—All such doorways, and all passageways, must, where of a less width than 3 ft. 6 in., be increased to that width.

Door-fastenings.—All such doors must be fitted with automatic bolts only, if fastenings be required.

IX.—LIFTS.

Inclosing of Lifts.—Lifts should be enclosed all up with brickwork 9 in. thick, or with incombustible material of approved quality and thickness, and fitted with iron or other fire-resisting doors, unless, with the approval of the Council, such lifts be enclosed with fire-resisting materials to a height of 4 ft. above each floor level, and above this with stout wire-mesh guard.

Lifts must be kept at some distance from staircases, and must in no case be connected directly therewith by means of openings or otherwise.

X.—WINDOWS.

Windows to Open.—All windows on the floors above the ground floor, facing the public-way, street, thoroughfare, or open space must be made to open easily at sill level to a sufficient height and width to allow a full-grown person to pass through in case of need.

LONDON BUILDING ACT, 1894:

CASES BEFORE THE TRIBUNAL OF APPEAL.

THE Tribunal of Appeal under the London Building Act, 1894, sat at the Surveyors' Institute, on Monday, to hear two appeals against decisions of the London County Council. The members of the Tribunal present were Messrs. Arthur Cates (chairman), A. H. Hudson, and J. W. Penfold.

The first appeal engaging the attention of the Tribunal was brought under Section 13, by the New Westminster Brewery Company, and had reference to the refusal of the London County Council to grant their consent to a proposed one-story addition at the rear of the "White Horse and Bower" public-house, 86, Horseferry-road, Westminster. Mr. Craies, barrister, appeared for the appellants, and Mr. Seager Berry, from the solicitors' department of the Council, represented the respondents.

From the statement by the learned counsel for the appellants, it appeared that the Brewery Company acquired a cottage abutting on Monk-street at the rear of this public-house, their object being to demolish it and erect on the site an addition, or what counsel thought might be more correctly termed an annexe to their premises. The cottage had a forecourt about 3 ft. deep, and in their plans

* By the term "old buildings" are meant those of which he construction was begun before the commencement of he Acts, viz.:—For factories, January 1, 1892; for workhops, laundries, &c., January 1, 1896

the company proposed that the addition should extend over this. On the other hand, however, the plans provided that the height of the new building should not exceed 14 ft., the height of the old flank wall; and, moreover, to prevent any objectionable feature attending the proposed building, it was decided that it should be without windows. The new addition was, according to Mr. Craies, required to meet a public want. Opposite the site were the works of a gas company where a large number of men were employed, and the annexe to this public-house would offer facilities for luncheons and would contain a billiard-room which could not be objected to in any licensed establishment. Accordingly application was made to the Council on December 22 last to approve the plans, but a reply was received that the Council could not give their sanction because, owing to the narrowness of Monk-street, the front of the proposed building would be less than the prescribed distance from the centre of the roadway. Subsequently, on January 16, an amended plan was submitted, but the Council upheld their previous decision; and the question now before the Tribunal was whether they would endorse the action of the Council, or act in the spirit of Section 13, Sub-section 4, of the Act, and hold that a reasonable case had been made out by appellants to entitle them to have their plans passed. The question in this instance was entirely one of expediency, and the scheme, if carried out, would be in the interest of the public. With regard to the Council's objection that Monk-street was too narrow to permit of this structure being erected, Mr. Craies pointed out that the street was in no sense a residential one, that it was very little used by vehicular traffic, and that it was practically impossible to contemplate a public improvement in the thoroughfare, because there were two huge gasometers opposite the cottage.

Mr. J. H. Budd, architect and surveyor to appellants, gave formal evidence upon the plans, and in reply to Mr. Seager Berry contended that one serious objection to the forecourt being allowed to remain was that as the street was quiet and dark at night nuisances might arise.

Mr. Seager Berry said the Council was under the impression, rightly or wrongly, that the proposal not only infringed the rule as to prescribed distance, but also involved a question as to line of frontage. Moreover, the Council saw no reason why the question of the erection of a billiard-room should bar the way in future to any widening scheme that might arise. At present the street could be widened from end to end without much difficulty. The case was entirely one for the Tribunal, but he would submit that the decision of the Council should not be reversed unless stringent conditions were imposed.

After some discussion, the Tribunal allowed the appeal, but imposed the conditions that a protecting rail should be erected beside the adjoining cottage, that the erection should not be above 14 ft. in height, and that no building or structure be erected above an angle of 45 deg. from the top wall. No order was made as to costs.

In the second case, the trustees of the late Captain W. B. Phillimore appealed against the refusal of the Council to allow the formation or laying-out of new streets for carriage traffic on land and house known as Moray Lodge, Campden Hill, Kensington.

Mr. Macmorran, Q.C., and Mr. Harper represented the appellants, and Mr. Seager Berry appeared for the Council.

Mr. Macmorran explained that Moray Lodge, together with several other large houses and grounds, formed a large estate in the heart of Kensington. The appellants were the freeholders of Moray Lodge, and having, by an arrangement approved by the Court of Chancery, acquired the lease, they were desirous, in consequence of the difficulty of letting this class of property, of erecting a number of smaller houses on the estate, at a rental of from 150*l.* to 200*l.* per annum—houses which were in great demand at Kensington. Before this could be done it was necessary that a new road should be constructed from south to north of the estate. The Moray Lodge scheme was intended only as part of a general scheme of development for the whole freehold estate. The leases of several other lodges and grounds would not fall in until 1914, but in all probability the trustees would be able to acquire them before that period. The difficulty which presented itself, however, was in relation to Thorpe Lodge, which was situated at the extreme north of the estate. The leaseholder of this place had not come to terms with the appellants. They, therefore, were unable to carry the road through to the public thoroughfare on the north side of the estate, and the Council had refused to sanction the scheme on the ground that the new street would not have direct communication with a public highway at the northern end. There did not seem to be any prospect of getting over the difficulty as to Thorpe Lodge, the lease of which would not fall in until 1954, but appellants had so arranged the scheme of development that Moray Lodge could be regarded as only a part of the general scheme to be carried out when the other leases fell in. Kensington Vestry had notified their approval of the scheme, and he asked the Tribunal to bear in mind that to deny appellants' sanction to the scheme would be to practically prevent any development until, as far as they could see at present, 1954.

Evidence was given by Mr. Eustace J. A. Balfour, architect, and Mr. William Weaver, Surveyor to Kensington Vestry. The latter said he had reported to the Vestry strongly in favour of the scheme.

Mr. Seager Berry said the great objection held by the Building Act Committee of the Council, and which justified their refusal, was that the trustees were not in a position to give a binding undertaking that the development would be continued on the lines sketched out. Within the past fifty years several Building Acts had been passed, and there was no telling what the next fifty years would bring forth in the same direction. This made the duty of the present Council all the more onerous.

Eventually, the Chairman intimated that the Tribunal considered the application premature, and they were bound, on the facts disclosed, to dismiss the appeal.

THE ARCHITECTURAL ASSOCIATION SOIRÉE.

THE soirée of the Architectural Association was held on Friday last week at St. George's Hall, Langham-place, when "The Druids' Elect" was again performed, with a success equal to that which characterised the dress rehearsal on the previous Wednesday,* and with even greater enthusiasm.

During the evening Mr. Fellowes Prynne, the President, said that he had been asked, and no doubt the question was intended as a compliment to the gentlemen who had acted, "Why do these gentlemen spend their energies on architecture?" He offered his congratulations to the ladies and gentlemen who had taken part in the play.

Illustrations.

BRITANNIA ROYAL NAVAL COLLEGE, DARTMOUTH.

THIS building, to be erected by the Lords of the Admiralty, will occupy a beautiful site on the Dart known as the Mount Boon Estate, about 200 ft. above the river, and immediately above where the *Britannia* is at present stationed.

Accommodation is provided in the building for 260 cadets and staff.

The educational buildings form the central block, and contain a large hall, 90 ft. by 50 ft., with two floors of class-rooms on either side, including lecture-room, steam study, and chart-room, with reading-rooms on the first floor; while at the end of the hall is the seamanship-room, the front of this block containing the captain's and chief officers' and instructors' rooms.

On either side of the central block are the dormitory and day-room blocks, each block for 130 cadets, with day-rooms on the ground floor and dormitories over for thirty-three cadets in each, the dormitories being arranged for hammocks and sea chests, and with a lieutenants' room between each pair of dormitories.

On the north side of these blocks are sanitary blocks, with changing-rooms, shower-baths, boot-rooms, &c., on the ground floor, and lavatories, bath-rooms, and the usual accommodation on the dormitory floors.

The block at the western end contains the cadets' dining hall, 80 ft. by 40 ft., entered from a large lobby at the end of the main corridor, with serving-room, cadets' kitchen, and the usual scullery and stores. On the south side of this block and towards the view are the officers' ward, the mess-room, &c., with kitchens and stores complete. On the north side are the various mess-rooms for the petty officers and staff with their kitchens and stores, and dormitory accommodation over.

The corresponding block at the other end of the building contains the captain's house, also with a southern exposure towards the view, and a chapel to hold 350 persons.

The whole building, which has a southern frontage and a beautiful view towards the mouth of the Dart, is arranged in semi-detached blocks to secure ample proportion of air round each block. It is raised on a spacious terrace 34 ft. wide called the Cadets Terrace, which is overlooked at either end by the windows of the ward-room and the captain's house. A smaller terrace is provided at the west end for the officers and another at the east end for the captain. The main terrace is approached by a covered ascending drive at either end with a broad flight of steps in the centre, covered playgrounds being formed under the terrace.

The level space enclosed by the roads and terrace will be laid out as a garden.

The terrace walls throughout are being faced with the local limestone, and are now in course of construction, Mr. F. Marshall, of Plymouth, being the contractor.

The grounds, roads, and playing-fields are being formed under the supervision of Mr. H. E. Milner.

It is proposed to erect the buildings with Portland stone, red brick, and green slates.

Sick quarters with sixty beds will be built to the west of the site, consisting of infectious and non-infectious blocks, an administrative block, doctor's house, and quarters for the infectious nurses.

Mr. Aston Webb, A.R.A., is the architect.

* See our account of the play in last week's *Builder*, page 393.

THAXTED PARISH CHURCH.

THAXTED Parish Church, Essex, dedicated to St. John the Baptist, and also to St. Lawrence and the Virgin Mary, is one of great interest.

When and at whose cost this fine church was built can only be a matter of conjecture, as it is quite evident that the parishioners, even in their most prosperous days, could not without aid from other sources have accomplished its erection. The various coats of arms remaining in the church seem to point to the fact that the parish was assisted by persons of power and wealth connected with the place, though not inhabitants.

Thaxted, in early times a mere village, became in the time of Henry III. a town of some importance. The Cutlers had established themselves here, and appear to have exercised an extensive and flourishing trade, and it was about this time probably that the little village church which was situated not far off from the present structure, and dedicated to St. Catharine, was done away with, and a larger church built to suit the altered requirements of the town. Of this church the nave arcade is now the only remaining portion.

The descendants of the house of Clare were its chief patrons. Elizabeth de Clare, who succeeded to her share of the estates of the family and who founded Clare College, Cambridge, and was a munificent patroness of various good works in her day, very probably helped, but it is more likely that her son, the Earl of Ulster, did more. The south aisle and south transept are said to have been built in the fourteenth century, and also that the south porch was built by Lionel, Duke of Clarence, son-in-law of the Earl of Ulster mentioned above, and in the latter half of the same century. This, however, does not appear to have been the case, for the architecture is of a later date, being probably early fifteenth century work.

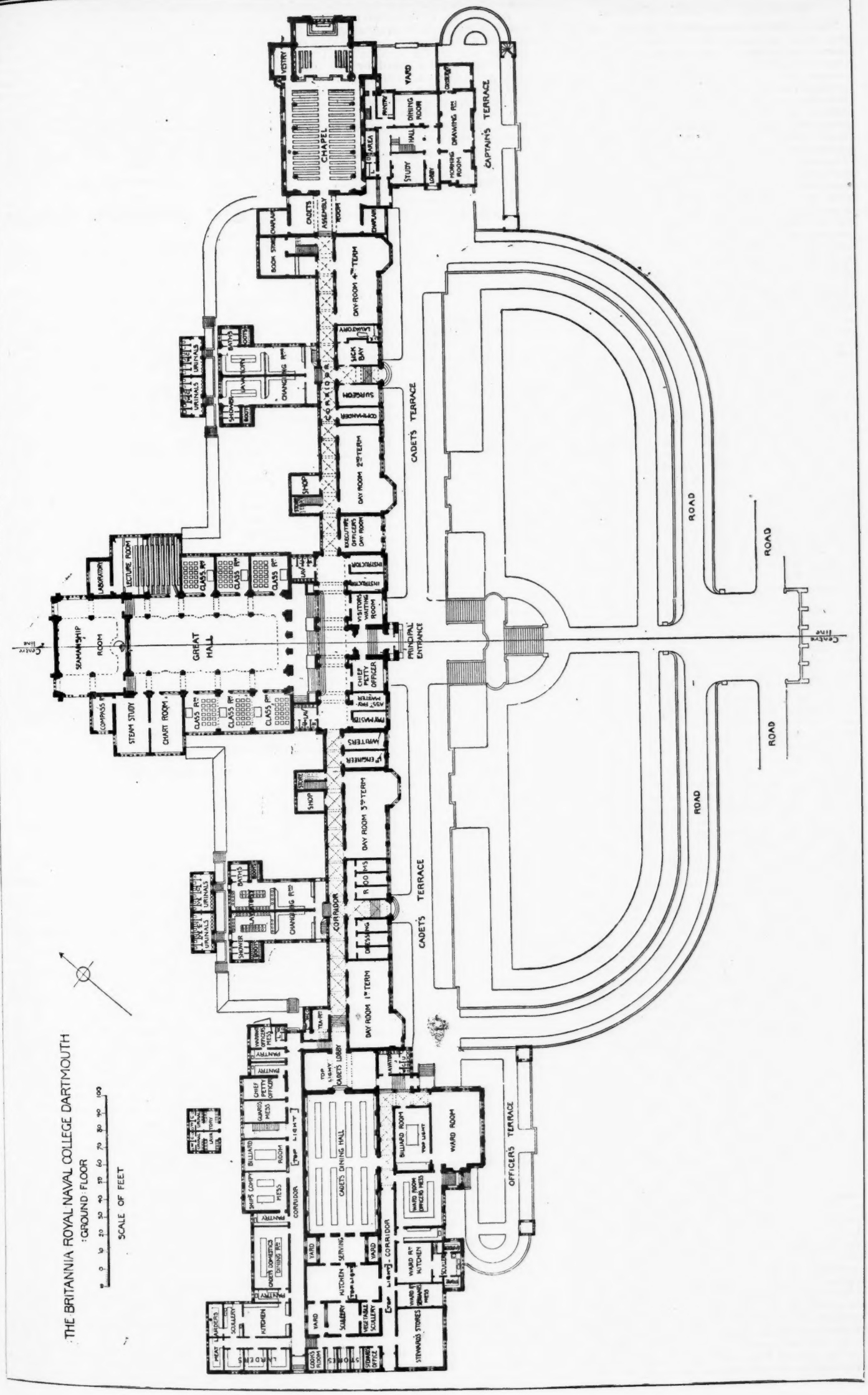
There is no doubt that many alterations were made by the family of the Mortimers who possessed the greater part of the manor of Thaxted. The north transept and north aisle were most probably built by the same family, and about the same period Edmund Mortimer, Earl of March, is supposed to have started this work and also to have built the tower and spire. The arms of March and Ulster still remain on the arches of the tower.

The chancel was completed, if not built entirely, by Edward IV., and was finished in 1465. The north porch is also supposed to have been erected by him. He appears to have taken some interest in the town and church, as his arms, carved in oak, may still be seen on one of the old houses.

The choir stalls were beautifully carved; the remains of them may be seen just within the tower arch, on the screen which divides the belfry from the church, but the greater part was carried away in the early part of last century. The timber roof in the aisles are most interesting examples of Perpendicular work, and are well worthy of notice, as is also the celatura at the east end of the roof of the Lady Chapel, as an example of what now rarely exists.

C. WONTNER SMITH.

PRIMITIVE METHODIST CHURCH, SOUTH MOOR.—The foundation stones have just been laid of a new place of worship for the Primitive Methodist body at South Moor. The new church, which is to be built of stone, will provide accommodation for nearly 500 worshippers. A vestry is included in the designs, and there will be direct communication with the school at the back. Mr. T. E. Davidson, of Newcastle, is the architect, and the contract has been let to Mr. Craven, of Beamish.


THE BRITANNIA ROYAL NAVAL COLLEGE DARTMOUTH
GROUND FLOOR
SCALE OF FEET
0 10 20 30 40 50 60 70 80 90 100
CHAPEL
VESTRY
YARD
DINING ROOM
DRAWING RM
MORNING ROOM
STUDY
HALL
LOBBY
CAPTAIN'S TERRACE
CADETS ASSEMBLY ROOM
CHAPLAIN
DAY ROOM 4TH TERM
SICK BAY
SURGEON
DAY ROOM 2ND TERM
SHOP
CADETS TERRACE
ROAD
EXECUTIVE OFFICERS DAY ROOM
INSTRUCTOR
VISITORS ROOM
PRINCIPAL ENTRANCE
LECTURE ROOM
LABORATORY
CLASS RM
SEAMANSHIP ROOM
GREAT HALL
CHIEF PETTY OFFICER
MASTER
MATE
MASTER
MATE
ENGINEER
COMPASS R.
STEAM STUDY
CHART ROOM
CLASS RM
CLASS RM
CLASS RM
DAY ROOM 3RD TERM
DAY ROOM 1ST TERM
CORRIDOR
CHANGING RM
BATHS
SHOWER
URINALS
LAVATORY
CADETS LOBBY
TOP LIGHT
PANTRY
WARRANT OFFICERS MESS
CHIEF PETTY OFFICERS MESS
GUARDS MESS
BILLIARD ROOM
SHIPS COMPY MESS
CADETS DINING HALL
WARD ROOM OFFICERS MESS
WARD ROOM
OFFICERS TERRACE
CADETS DINING RM
SERVING
KITCHEN
YARD
HARD
WARD R.M KITCHEN
SCULLERY
VEGETABLE SCULLERY
MEAT LARDERS
STEWARDS STORES
STEWARDS MESS
STORES
STORES OFFICE
CADETS MESS

HOLBORN TO THE STRAND.

THE London Improvements Bill, which has for its main object the construction of a thoroughfare from Holborn to the Strand, came before a Select Committee of the House of Commons on the 24th inst., presided over by Mr. A. H. Brown. The first witness to be called by Mr. Talbot, on behalf of the promoters of the measure, the London County Council, was Mr. G. Shaw-Lefevre. As to the proposals with respect to betterment and recoupment, he had always considered that in any public improvements recoupment was the best mode of obtaining the increment of value arising from the improvement in aid of the cost of the scheme, but there were cases in which betterment was preferable. In this particular scheme it was proposed to apply betterment to the south front of the Strand and recoupment generally over the remainder of the property affected. It would be absurd to apply recoupment to the Strand, as it would involve the buying up of the houses and businesses at enormous cost. Cross-examined by Mr. Pollock, Q.C., for the Duke of Norfolk, he admitted that Parliament in 1890 and 1897 rejected the idea that betterment should be applied to the south side of the Strand in connexion with a widening of that thoroughfare, and that the County Council itself omitted the south side of the Strand from the betterment area of the scheme of 1893. The present, however, was a different scheme, and the County Council Valuer was of opinion that the effect of the Bill would be to add considerably to the value of the property in the whole of the Strand.—Sir Alexander Binnie, Chief Engineer of the London County Council, said the general design of the new street had been the outcome of ten or fifteen years' deliberation on the subject, and the scheme before the Committee had been arrived at after consultation with the Royal Institute of British Architects. One of its great advantages was that it would create a great main thoroughfare with unexceptionable gradients. At present some of the gradients in the neighbourhood of the Strand were very trying, that of Wellington-street, for instance, being one in twenty-five. The gradient of the new thoroughfare would be one in ninety or one hundred, while that of the two branches into which it divided at the Strand end would be one in fifty or fifty-five. Questioned as to St. Clement Dane's Church, he stated that an agreement had been arrived at as to the line of curtailment of the churchyard for the purposes of the improvement. There was no intention of interfering with the church itself.—The following day Mr. Alexander Young, F.S.I., who for the past ten years has been the Valuer to the London County Council, gave evidence. Dealing with the cost of the scheme, he estimated that the gross expenditure on acquiring the necessary property would be 4,442,500*l.*, and after the completion of the improvement he computed that 4,088,300*l.* would be yielded by recoupment, leaving a net cost of 354,220*l.* To that had to be added a sum of 300,000*l.* for rehousing the working classes displaced and 120,000*l.* for the cost of works, with the result that the total net cost of the improvement would be 774,000*l.* He thought the scheme was the most favourable for the application of the principle of reconstruction that had come under his notice. It was the boldest scheme which had been considered, and was certainly the most economical. For the most part the new thoroughfare would run through what was at present either slum or semi-slum property. The character of the district would be entirely changed, and its value would be very greatly increased. It was estimated that the construction of the street would result in displacing 3,000 persons of the labouring classes, and there were 2,250 more for whom provision would have to be made in connexion with the Clare-market scheme. Accommodation would be found for 1,616 in the neighbourhood of the new street, for 1,670 within a mile of it, and the remainder would be rehoused on the Millbank-street site. Cross-examined by Mr. Erskine Pollock, Q.C., on behalf of the Duke of Norfolk, he admitted that the time to be allowed for the completion of the new street was seven years, and that after that the London County Council might postpone the fixing of the betterment rate for ten years. The result, of course, might be that property would be liable for seventeen years to have a betterment rate put on it without it being known what that rate would be, but he declined to admit that that would cause difficulties in dealing with the property.—On Wednesday, Mr. James Field, one of the Surveyors under the Board of Trade, who has had thirty years' experience in London, examined by Mr. Freeman, said he had considered carefully the scheme of the Bill, and could confirm the estimate which had been stated to the Committee that the cost of purchasing the properties would be, viz., 4,390,845*l.* The Bill would convert a district of slums into one of the finest avenues London possesses. So far as the relief of traffic was concerned, it would be a great Metropolitan improvement.—Do you consider it important that it should be carried out in completion of, and in conjunction with, the Clare Market scheme?—Yes. The Clare Market scheme has done much to clear away slums in the district bounded by the Strand and Holborn, and the present scheme will clear away all the rest. This district of slums will be pierced by an avenue composed of fine shops with fine residential flats above them. Do you not consider that this site between St. Clement Danes and Wellington-street will form a fine position for theatres?—Yes. This central site will be one of the architectural features of London, which will be visited by people coming from the east and west. There will be a magnificent opportunity to put up buildings which will be a credit to the Metropolis.—Mr. Thomas Blashill gave evidence in support of the Bill, declaring that the width of 100 ft. fixed upon for the new street was a very moderate width.

Correspondence.

To the Editor of THE BUILDER.

EMPLOYMENT OF CONTINENTAL PLASTERERS IN LONDON.

SIR,—My attention has been called to certain misleading reports in reference to the employment of Continental plasterers in London.

I beg to state that my Association has engaged the services of a large number of plasterers from the Continent. The Association's agents clearly informed those workmen that a trade dispute existed in London, in consequence of the unreasonable demands of the London plasterers, although it is possible that, out of the hundreds of men engaged, a few may be found who will state the contrary.

They have been properly cared for, and the bulk of them are now giving every satisfaction to their employers with regard to the quality, and more especially to the quantity of, their work.

The public will be interested to learn the cause of this situation. I may, therefore, explain that the original cause is *the limitation of apprentices*, by which the National Association of Operative Plasterers has brought about a chronic hindrance to the building trade.

For a long time the Plasterers' Association has been allowed to enforce its arbitrary rules on the trade, to the detriment of both employers and employed; and as this is *one* of the intolerable restrictions against which the employers are now contending, your readers may desire to know the rules under which this sytem has been enforced.

By-Laws to London Rules authorised by the N.A.O.P. Executive Council.

No. 1. "That the number of improvers shall be *one* to *seven* full-priced men, but, notwithstanding the above, no firm shall employ more than fifteen improvers at any one time."

Clause 1. "That *all* lads employed shall be registered, and shall pay a contribution of 1d. per week until they attain the age of 18 years. They shall then become full members of the N.A.O.P.

It will be observed that the Plasterers' Association not only limits the number of apprentices to *one* to *seven* men, but insists upon levying its toll upon *all* of them, and makes membership with their Association an essential to any apprenticeship.

Indentures of apprenticeship used to provide for the apprentice to be bound to the *master*, and that the apprentice "his master faithfully shall serve, his secrets keep, and all his lawful commands obey." But under the recent *régime* the Plasterers' Association ousts the master completely with an effrontery that is scarcely conceivable.

The immediate cause, however, of the engagement of Continental plasterers is to fill the places of workmen who persist in practices which apparently every one except themselves regards as not only objectionable but indefensible, for it is intolerable that the building trade of the country should be brought to a standstill, and workmen in other trades thus thrown out of employment for any such inadequate cause.

The services of Continental plasterers will, obviously, be required for a long time, until the increased supply of apprentices have become duly qualified mechanics.

As regards the Carton Pierre and Fibrous Plaster branch of the plastering trade, I may say that this has always been to a great extent a Continental trade, to which the British workman has not taken kindly, and so long as he persists in harassing his employers by his intolerance, they will naturally prefer to carry on their business with more contented, skilful, and energetic workmen.

In conclusion, allow me to mention a fact which is pregnant with significance to those who study these questions. My Association is paying these Continental workmen the full London rate of wages, which is about double the rate they can earn in their native country.

THOMAS COSTIGAN, Secretary,
London Master Builders' Association.

A NEW THEORY AS TO SOIL-PIPE VENTS.

SIR,—I think the following incident may be of interest to some of your subscribers.

Some little time ago I had to examine a house in London from a sanitary point of view; among other items, I objected to the soil and vent pipe, which was composed of light iron pipe, such as is used for rain-water purposes, with putty joints and narrow sockets. Shortly after my report being sent to my client I was requested to meet the house agent to discuss my report on behalf of the landlord. The first item he pounced upon was the soil-pipe, demanding to know what was the matter with it. On my explaining the usual objections, he calmly informed me that I must be very far behind the times, and that I apparently knew very little about air currents; and that "he always had soil and vent pipes fixed of this material, as, of course, anybody could see that the sun's rays could penetrate thin iron more easily than thick, or lead, and so heating the air in the pipe would cause an updraught." I left then. IGNORAMUS.

The Student's Column.

ARCHITECTURAL HYGIENE.

XVI.—VENTILATION (*continued*).

4. RESPIRATION AND COMBUSTION, &c.

RESPIRATION.—Beside the ordinary impurities, the action of breathing or respiration helps to render the air in a room impure unless it is renewed. Respiration abstracts oxygen, increases carbonic acid, and adds watery vapour, ammonia, and organic matter to the air; besides which there are exhalations more or less odorous from the skin. The amount of carbonic acid given off by an adult per hour is ·6 cubic feet.

Combustion.—Coal when burnt gives off carbonic acid, carbonic oxide, sulphuric acid, and other impurities. According to Galton, analyses of various sorts of coal showed that they contained a mean of 1·7 per cent. of sulphur, and that the ash from such coal contained only 0·2 per cent. From this it will be seen that the burning of 1,000 tons of coal would send fifteen tons of sulphurous acid into the air, which would become converted into sulphuric acid.

Turning to coal gas we find that it forms an important cause of impurity in houses, for its products of combustion are carbonic acid, carbonic oxide, ammonia, and sulphur compounds.

Without going fully into calculations it is stated that each cubic foot of gas burnt per hour vitiates as much as one human being does by respiration. An oil lamp similarly affects the purity of the air but in a less degree, although for the amount of light obtained it is stated to foul the air more than gas.

5. QUANTITY OF AIR REQUIRED.

We have now considered the composition of air, the impurities to which it is liable by contamination, and also by respiration and combustion. We now come to the very important point as to the quantity of air required by a human being.

According to Hood, women and children do not require such a large allowance as men; the proportion being two-thirds for females, and one-half for children.

Respirated air contains about 4·5 per cent. of carbonic acid, depriving the air of that amount of oxygen. An average adult, as already stated, gives off about ·6 cubic feet of carbonic acid per hour, and as 1,000 cubic feet of air under average circumstances contain ·4 cubic feet of carbonic acid, an addition of ·2 cubit feet will react the limit of the standard of purity allowed, viz., ·6. An adult will therefore render 3,000 cubic feet of air impure in one hour, because he will add ·2 cubic feet to each thousand, which will thus have absorbed the largest amount of carbonic acid which is permissible.

We now, therefore, arrive at the following data, that we should have a system of ventilation which shall give each person 3,000 cubic feet of fresh air per hour. Thus in an air-tight room or compartment, for a man to live, say, ten hours, it would be necessary for it to contain 30,000 cubic feet, if the air was not to be rendered more impure than the accepted standard. If an airtight room only contained 1,000 cubic feet, it would, by the same calculation, suffice for one person only twenty minutes.

This is a Utopian standard, however, which in practice seems to be seldom adhered to, and, indeed, Hood takes pains to state that it may not be necessary. The late Sir Douglas Galton asserted that no room could be considered even tolerably ventilated as a permanent arrangement unless at least 1,000 cubic feet of air per occupant are renewed per hour. Consequently, in a room 20 ft. by 15 ft. by 10 ft. high, which contains 3,000 cubic feet, and is occupied by three people, the air would not require changing more than once an hour,

but if occupied by fifteen people, it would require renewing five times an hour.

Authorities differ largely as to the quantity of air required. Dr. Whitelegge, for instance, states that 500 cubic feet per head per hour is the minimum allowance, and that for rooms not continuously occupied 1,000 ft. per head is quite sufficient if passing through the room at a velocity not exceeding 5 ft. per second. Other writers give from 3 to 30 cubic feet per minute for people undergoing no exertion, and as much as 70 ft. for ball-rooms, hospitals, or workshops.

As it is generally practically impossible, however, to tell the number of people who will inhabit any particular apartment, heating engineers, as a rule, calculate that the air of an apartment should be changed from one to six times an hour according to the purposes for which it is used, *e.g.* :—

	Times an hour.
Large hall and churches (in consequence of large cubic space.....	1
Dancing-rooms	4
School-rooms	3
Hospital	5 or 6

Rooms are rarely so well built but that air can enter freely. The doors and windows of ordinary houses are not so closely fitted as to prevent air currents, which thus ventilate the room, even in the absence of other intended ventilation.

Again, sitting-rooms are not used continually like hospitals, and will, therefore, get their supply replenished in the intervals.

In order, however, to avoid draughts, it is usually assumed in a country like England that the air of a compartment should not be changed oftener than three times an hour, unless the incoming air is warmed; so that a room containing 1,000 cubic feet, which could be changed as above, is generally stated as a standard of measurement for ordinary purposes.

This question of draughts is most important, because no system of ventilation can be considered perfect which produces such a draught as can be felt by the inmates.

Further, the supply of fresh air should not move with a greater velocity than 5 ft. per second, so that the number of people in an apartment should be regulated in such a way that sufficient air can be given at a velocity not exceeding that rate.

Cubic Space.—As to the amount of *cubic space* which should be provided for each person, the following table has been prepared after reference to various other authorities :—

	Cubic feet of space per head.
London Board School.....	130
Board Schools (Education Dept.).....	80
Canal Boats (adults).....	60
„ (children)	40
Common Lodging Houses 300-400	
Army Permanent Barracks	600
Prisons with separate cells	800
	per bed.
Army Hospital Wards.....	1,200
	per seat.
Army Chapel Schools.....	200
„ Infants' Schools	96
	per horse.
Stables (open roofed)	1,200
„ (with men over)	1,300

Quantity of Air per Person per Hour.—The following table from Hood gives the quantity of air which should be provided *per person per hour* for a room occupied to its maximum capacity, the inlet being sufficient :—

	Cubic feet per person per hour.
Ordinary living rooms	1,200
Sleeping apartments	900
Schools (scholars of full age)	900—1,200
„ (infants)	720
„ (dormitories)	720
Meeting rooms, public halls, lecture rooms	1,200—1,500
Ball rooms.....	2,100—2,400
Theatres, dining halls, &c....	1,200—1,500
Hospitals (ordinary).....	1,200
„ (infectious)	2,100—3,000

It will be seen from this table that Hood's standard is not as high as many authorities, but in practice it seems to be the one most usually adopted. In very many cases it is even considerably higher than that which is obtained.

As an example, by the Factory Acts adequate ventilation is prescribed, and this is generally taken as signifying 250 cubic ft. per head per hour in ordinary working hours, and 400 cubic ft. during overtime.

From these data the amount of air which it is necessary to introduce per hour can be calculated to maintain a given standard of purity.

Let x = volume of fresh air required per hour per head to maintain required standard B.

A = the number of cubic feet of carbonic acid in 1,000 cubic feet of fresh air = 0·4.

B = proposed maximum limit of carbonic acid in the air of a room (usually taken at 0·6 parts of carbonic acid per 1,000 volumes of air).

C = the number of cubic feet of carbonic acid given off per head per hour = 0·6.

n = number of persons to be provided for.

$$\text{Then } x = \frac{C \times n}{B - A} \times 1{,}000 = \frac{600\,n}{B - 0{\cdot}4} = \frac{600\,n}{0{\cdot}6 - 0{\cdot}4}$$

And supposing that the number of persons = 100, then

$$\frac{600 \times 100}{0{\cdot}6 - 0{\cdot}4} = \frac{60{,}000}{0{\cdot}2} = 300{,}000 \text{ cubic feet per hour.}$$

And provision must be made for this amount to enter, the impure air being extracted at the same time.

Velocity.—According to "Montgolfier's" rule, air under pressure will enter a *vacuum* with a velocity equal to that acquired by a body falling from a corresponding height (H), and this velocity is determined by the formula $V^2 = 2gH$.

When H = the height (under standard conditions of barometer and thermometer H = 5 miles, or 26,400 ft.).

g = acceleration due to gravity (32·18 ft. per second).

V = velocity required in feet per second.

$\therefore V^2 = 2 \times 32{\cdot}18 \times 26{,}400.$

$V^2 = 1{,}699{,}104.$

V = 1,300 ft. per second.

In ventilation problems, however, the air passes not into a vacuum, but into a space containing air at a low pressure, so that the velocity is dependent upon the difference of the barometric pressure (P) and the air under a low pressure (p).

It is also necessary to calculate the height (h) of a uniform column of air of the standard of density (as was adopted in determining H), which would give the pressure p.

The formula being, therefore, for ordinary ventilation problems :—

$$V^2 = 2g(H - h);$$

and after substituting various values it may be put—

$$V = 8\sqrt{x - \frac{x}{1 + {\cdot}002\,(t - T)}}$$

in which x = height of vertical flue.

t = temperature of room.

T = „ „ open air.

Example : Let $t = 60°$ F.

T = 40° F.

x = 20 ft.

$$\text{Then } V = 8\sqrt{20 - \frac{20}{1 + {\cdot}002\,(60 - 40)}}$$

V = 7·1 ft. per second.

Therefore, if we find the sectional area of the flue in feet and multiply by the linear velocity, it will give us the number of feet discharged per second.

There is one point which in practice we must not omit, and that is friction; this varies directly as the length of the tube L and the square of the velocity, and inversely as the diameter D, viz., $\frac{V^2 L}{D}$. In practice this allowance is usually $\frac{1}{4}$.

De Chaumont's rule for ascertaining the relation between the size of the opening and the hourly delivery of air is as follows :—

$$D = 200 \times \phi \times \sqrt{{\cdot}002 \times x \times (t - T)}$$

where D = the required delivery of air in cubic feet per hour.

ϕ = sectional area of inlet or outlet or of tube in square inches.

x = height of heated column of air in feet.

t and T = internal and external temperatures respectively.

Example :

If x = 20

t and T = 60 and 40 respectively.

D = 6,000

$$\text{Then } 6{,}000 = 200\,\Phi \times \sqrt{{\cdot}002 \times 20 \times (60 - 40)}$$

$$6{,}000 = 200\,\Phi \times \sqrt{{\cdot}8}$$

$$6{,}000 = 178\,\Phi$$

$$\frac{6{,}000}{178} = \Phi$$

$$33\frac{126}{178} = \Phi$$

$$33{\cdot}56 = \Phi$$

BOOKS RECEIVED.

THE STORY OF NUREMBERG. By Cecil Headlam (J. M. Dent & Co.)

MURRAY'S HANDBOOK TO WARWICKSHIRE (John Murray.)

MEISTERWERKE DER BAUKUNST UND DES KUNSTGEWERBES ALLER LAENDER UND ZEITEN. Edited by Hubert Joly. Part I. (H. K. Koehler, Leipzig.)

MANUALE DE ARCHITETTURA ITALIANA ANTICA E MODERNA. Di Alfredo Melani. (U. Hoepli, Milano.)

THE TALL BUILDING UNDER TEST OF FIRE. By H. de B. Parsons. (No. 17 of Publications of the British Fire Prevention Committee.)

JOURNAL OF THE SANITARY INSTITUTE. April, 1899. (E. Stanford.)

FIRE TESTS WITH FLOORS. (No. 15 of Publications of the British Fire Prevention Committee.)

OBITUARY.

MR. J. P. FORDHAM.—We regret to record the death of Mr. J. P. Fordham, whose name is familiar to our readers as a partner in the firm of Messrs. Douglas & Fordham, architects, of Chester (now Douglas & Minshull). Mr. Fordham was a native of Essex, but received his professional education at York; he subsequently entered the office of Mr. Douglas, of Chester, and became his partner. Mr. Fordham retired from the firm in 1898, and died at Bournemouth on the 10th inst., aged fifty-five. During his partnership the firm of Douglas & Fordham carried out a great deal of work at Chester and upon the Eaton estate; also schools at Port Sunlight, the Parish Church at Rossett, Denbighshire; "Abbeystead," Wyresdale, Lancashire, Glangwrna near Carnarvon, &c. They were concerned in the widening of St. Werbergh's-lane, now St. Werbergh's-street, Chester, and built the branch Bank of Liverpool offices at the Eastgate end, several shops, and a block of offices at the cathedral end.

PORTISHEAD SEWERAGE SCHEME.

THESE works have been successfully completed, and everything in connexion therewith is in perfect working order, and the house connexions are being rapidly proceeded with.

The sewage, without treatment of any kind, is discharged into the River Severn at a point about a third of a mile from the shore. The point of discharge was selected after making very careful experiments to ascertain the set of the tides, and the rise and fall of the tides were taken every quarter of an hour for fifteen days. With the aid of these observations it was possible to select a point of discharge where the sewage would for certain be carried well out from the shore, whether the tide be ebbing or flowing, and to design the sewers so as to enable them to discharge at all states of the tide without providing storage tanks. Owing to the large range of tide at Portishead, being as much as 43 ft. between high and low water of high spring tides, the sewage will discharge at all states of the tides, except in the case of high spring tides, when the sewage will accumulate in the outfall sewer for a short time before and after high water, to be discharged directly the tide has fallen a few feet. Valves are provided to keep the sea-water out of the sewers, and owing to these, and the fact that the low-level sewers are distinct from the high-level, the sewage having to be lifted from the former to the latter, it is impossible for the sewers in the lower parts of the town to be flooded with sea-water, frequently the case in many towns with an outfall into the sea. The outfall sewer has been so arranged that, should it eventually be found necessary to construct a storage tank or sewer to retain the sewage for a short time before and after high water, such could be easily provided.

In many cases it would be most objectionable to discharge crude sewage into the sea, but when the conditions are in every way as favourable as at Portishead, there cannot be a more successful method of sewage disposal. (It is proposed to turn the whole of the sewage of Bristol into the Severn without treatment, as it is understood, and if this can be done without fear of a nuisance being created, there need be no fear as to the method adopted for the disposal of the sewage of Portishead ever causing a nuisance.)

The outfall sewer from the beach runs in a perfectly straight line in a north-westerly direction

to low water. For the whole of this length, 1,896 ft., it is constructed of cast iron pipes, 15 in. internal diameter, 9 ft. in length, and weighing approximately 16 cwt. each. The joints, which were specially designed for the Portishead works, are of the spigot, socket, and flange type, the flanges being bolted with six 1¼ in. bolts, against a rubber ring. For the greater part of its length, the outfall has been laid between rows of 8-in. and 10-in. elm piles, ranging in length from 11 ft. to 18 ft., placed 9 ft. centre to centre, and supported on cross pieces bolted to the piles. Longitudinal sills run along both lines of piles. In the mud the piles were driven without shoes, but in the sand and hard ground it was found necessary to shoe the piles. Towards the shore the pipes are supported on concrete piers for some distance, and for the remainder of their length on rock or a foundation of concrete. The pipes and piles for the whole length of the outfall, except a few feet from the end, are below the surface of the exposed shore, and are, therefore, not subject to the violence of the storms, nor do they become an eyesore, as is the case with many sea outfalls.

The total length of main sewers on the high and low levels is approximately eight miles.

High-level Sewers.—These consist of 8-in. to 15-in. internal diameter sewers, the depth below surface of ground or road level varying from 4 ft. 3 in. to 36 ft. 4 in. The deeper sewers were constructed in tunnel. The strata proved to be of a very variable character, and a considerable quantity of water was met with in places, necessitating the introduction of subsoil drains and much pumping. For the most part the tunnels were driven through hard rock, with fissures which allowed the water to penetrate to the workings. In tunnel the pipes were well bedded on, and surrounded with Portland cement concrete; but previous to being surrounded with concrete each length, notwithstanding the depth beneath the surface, was tested with water under considerable pressure. In places where a branch sewer joins a main which is at a much lower level, the communication is made by means of cast iron pipes fixed vertically inside the manhole built at the junction. When the difference in level is very slight, the sewage is conveyed from the high-level sewer to the lower one by means of a stoneware back-drop outside the brickwork of the manhole.

Low-level Sewers.—The low-level sewers are chiefly 8½in. and 9 in. diameter stoneware pipes. The main sewer through the town is constructed of Parker & Hassall's double lined pipes. In fact these pipes have been used in all water-logged positions; and in cases where the soil was dry, in the highest parts of the low-level system, ordinary deep socketed pipes were used. The character of the soil on the line of the low-level main was found to be of a very unreliable and variable character, soft blue clay, shifting sand, gravel, and live soils of various kinds being met with at one place or another, and these were water-logged to within a very short distance of the surface of the ground. In most instances it was necessary to close board the trenches and pack behind boards with straw, &c. The bottoms of the trenches were not sufficiently stable to lay the pipes upon and various means had to be resorted to to secure a good foundation. In some places the trenches were excavated to the hard marl beneath, and filled to the underside of the pipes with Portland cement concrete; in others the bottom of the trench was piled, close boarded, and concreted prior to the laying of the pipes; in other cases concrete in bags had to be resorted to to secure a good foundation. After laying, the pipes were haunched with Portland cement concrete. Subsoil pipes were put in for the greater part of the length of these sewers, and steam pumping to keep the trenches clear of the subsoil water had to be resorted to for months. Owing to the treacherous nature of the ground it was found necessary to leave a considerable quantity of the timber in the trenches to protect the gas and water mains and the adjacent buildings.

These sewers, notwithstanding the great difficulties met with, and the fact that they have on several occasions been subject to a considerable internal hydrostatic pressure, and a constant external pressure of several feet of subsoil water, are believed to be absolutely water-tight. The dry weather flow on the low-level system, including whatever leakages there may be in the brickwork of the manholes, is barely sufficient to cover the floor of the manholes at the lower end of the main sewer in thirty-four hours. Such a result, under the conditions enumerated, has seldom been attained. The permissible leakage allowed by some engineers in a new sewer classed water-tight is as much as 1 to 1½ cubic foot per mile per minute. Taking the smaller allowance, this would give upwards of fifty times more leakage than the recent flow in the low-level sewers at Portishead. The amount of gas that would be consumed in lifting the moisture from all sources discharging at the lower end of the sewer for a period of twelve months would be about 3,000 cubic feet, an unappreciable amount.

Manholes.—These have been constructed throughout with hard wire-cut Cattybrook bricks, jointed in Portland cement mortar, and in wet ground the outside of the manholes has been rendered in neat Portland cement to within a short distance of the ground. The brickwork, practically speaking, is water-tight, and must be so considering the small amount of water discharging at the end of the outfall.

Lampholes.—These have been put in in a few places, and were constructed by building at the change of line or gradient a small concrete chamber and bringing therefrom a 9-in. stoneware pipe to within a foot of the ground, the shaft being surrounded with 6 in. of concrete. There are altogether about 135 manholes and lampholes.

Ejector Chambers.—Ejector chambers for the reception of Shone's Pneumatic Ejectors have been built beneath the surface of the roadway in brickwork and concrete; and these are watertight, although the floor of the ejector in each case has at times upwards of 17 ft. of subsoil water above it. The chambers are lined with white glazed bricks.

Engine House.—The combined engine house and air-compressing station is built of selected Cattybrook bricks, with box stone dressings. The inside walls, to a height of several feet, are lined with glazed bricks. The roof is covered with ordinary red tiles, and the inside woodwork in roof is wrought fair and stained and varnished.

Machinery, &c.—The whole of the low-level sewage is lifted by means of Shone's pneumatic ejectors. Crossley's gas engines and air compressors are in duplicate. Two ejectors are fixed in each chamber, and it is possible to work either of them. The cast-iron compressed air main is 2 in. diameter and leads from the air compressing station to each ejector. The ejector discharges into the cast iron sewage main, increasing from 5 in. to 6 in. internal diameter. Outside the air compressing station the lifting of the sewage goes on automatically. All the sewage flows by gravitation to the ejectors within the chambers, and the rising sewage automatically opens the valve in the compressed air main, lets in the compressed air and the sewage is forced up the sewage main to the high level gravitating sewer to the point of discharge, and this action will continue as long as the compressed air is kept at a pressure of from 18 lb. to 22 lb. per square inch, and there is sufficient sewage flowing to fill the ejectors. The arrangement looks complicated at first sight, but it is beautifully simple and does its work well.

Flushing Arrangements.—Automatic flushing tanks with field annular syphons, supplied with Company's water, have been built at several points, and at the dead end of branch sewers. In cases where automatic flushing-tanks are not provided, disc-valves have been placed on the outlet side of the manholes, so that these manholes can be converted into flushing-tanks by closing the valve and filling the manhole from a water-cart or neighbouring ditch or stream, should such be at hand. Disc-valves are placed in several manholes along the line, so as to assist the flushing arrangements.

Junctions have been put in for all existing houses along the line of sewers and wherever it is at all likely that houses will be built. The junctions have been temporarily closed, pending the connexion of the house drains, by means of a stoneware disc bedded in Medina cement, and held in position by means of an iron cramp and thumb-screw, the remaining space of the socket being filled with Medina cement. This plan has been found successful, for whilst it makes a water-tight joint the stoppers can, with care, be easily taken out when it is desired to do so for the purpose of making the house connexions.

Where the sewers are very deep the junctions have been brought up to within a few feet of the surface of the road, so as to make the work of connexion much less costly and troublesome. The pipes forming the vertical connexions have been surrounded with concrete and made perfectly water-tight.

Ventilation.—The system adopted for ventilating the sewers is that known as "The Column and Shaft System." Cast-iron ornamental columns are fixed in various parts of the district at the edge of the pavement and other suitable positions, and shafts are fixed to the sides of the houses in a few places. Many more of these shafts should be fixed from time to time whenever permission can be obtained to do so, and it is rarely that permission is withheld, since the fixing of a shaft at any point relieves the drain in the vicinity from the internal pressure that would be otherwise exerted by the sewer gases. Each shaft is supported at its lower end with a cast-iron ducksfoot bend resting on a block of concrete. A rust pit is provided for catching the rust, &c., and preventing the possibility of the pipe becoming useless through being blocked. An inspection and cleansing hole has been provided in the ducksfoot bend for the purpose of removing anything let down the pipe. The columns were designed so as to serve the purpose of electric light standards or lamp posts, and special attention has been paid in fixing the positions of the columns so that if eventually they were called into use for either of the above purposes, they could be of the maximum advantage. There is a receptacle in the base of each column to catch rust or anything else finding its way into it. This receptacle can be reached from a door in the lower part of the column.

It was originally intended that ventilating cowls should be fixed at the top of the vent columns and shafts, and this is necessary both to give a finish to the shaft or column as the case may be, as well as to prevent birds nesting therein, and also to assist aspiration.

The ventilation of the low-level sewers is aided by fixing two very high 9-in. diameter cast-iron ventilating exhaust columns. These are fixed in connexion with the nozzle chamber attached to the sewers and the ejector chamber and the exhaust pipe discharging the spent compressed air. The compressed air, after ejecting the sewage, discharges into these high columns through the nozzle chamber, drawing the air from the ejector chamber and sewers and driving or forcing it up the column.

Materials.—The Parker & Hassal's pipes were supplied by Messrs. Hexter Humpherson & Co. and Messrs. Wragg & Co. Syke's screw-joint pipes by the Albion Clay Company; and the deep socketted ordinary pipes by the above makers and Messrs. Doulton & Co. The bricks used in the construction of the manholes, engine-house, ejector chambers, &c., were selected wire-cut stock bricks made and supplied by the Cattybrook Brick Company. The Portland cement was supplied by Messrs. J. & B. White Bros.; the Field's automatic siphons for flushing tanks by Messrs. Stone & Co.; the disc valves for manholes, lamphole covers, special manhole covers and tide valves by Messrs. Ham, Baker & Co.; the ordinary manhole covers by the Bristol Foundry Company; the cast-iron pipes for sea outfall by Messrs. Roberts, Ltd., West Bromwich; the ventilating columns by Messrs. Parsons & Sons, near Dudley; the ordinary ventilating pipe by Messrs. Allen, Sen., & Son; and the gas engines, air compressors, ejectors, air and sewage mains and other lifting plant were supplied, fixed, and put in working order by Messrs. Hughes & Lancaster. The whole works cost approximately 18,500*l.*

Mr. F. W. Trimm was clerk of works throughout. Messrs. J. & T. Binns, contractors, Horwich, have carried out the main contract. Mr. T. J. Moss Flower, C.E., F.G.S., of Westminster and Bristol, acted as engineer, and prepared and carried out the scheme.

GENERAL BUILDING NEWS.

RESTORATION OF BANSTEAD CHURCH.—The restoration and repairs which have been in progress for the last nine months are now completed. A clearstory has been formed over the nave arcade of six three-light traceried windows filled with leaded lights, the roofs have been stripped, repaired, and re-tiled. The stonework has been generally repaired, drains re-laid, &c. Through the liberality of a parishioner the interior has been decorated with frescoes, the sanctuary having angels, with wings outspread, standing on clouds and carrying in their hands scrolls. In the splays at sides of windows, sills, and spandrels of lancet windows, the sacred emblems with foliage are introduced, a gold scroll forming capping to the dado, which is painted an olive green. The fresco in the chancel arch represents the great Act of Atonement; the central figure of the crucified Redeemer is life size, and on either side is an adoring angel, the background being relieved with golden stars. Above the cross bar of the arch is the sacred monogram I.H.S. from which issue rays of glory, immediately below which occur the initials of the Alpha and Omega. Following the line of the arch is a label bearing the texts "I, if I be lifted up, will draw all men unto Me." Texts are also carried round the arches of the nave arcade. Mr. F. J. Shopland, contractor of Sutton, carried out the restoration and repairs to the fabric; the decorative work being done by Messrs. Heaton, Butler & Bayne, under the superintendence of Mr. J. Hatchard Smith, architect, London.

PRESBYTERIAN CHURCH, CARDIFF.—Memorial stones of the Presbyterian Church of England, Roath Park, Cardiff, have just been laid. The church stands on a site at the junction of Penylan-road and Marlborough-road, and facing the entrance to Roath Park. It consists of nave, with transepts and chancel, with porches and a vestibule. The internal length is 125 ft., the width of nave 47 ft., and in transepts 62 ft. There will be an open timber roof in pitch pine, the height being 42 ft. The seating and all other woodwork will be in pitch pine. The chief external features will be the tower and spire, 150 ft. high. The central doorway is a copy of Tintern Abbey doorway; there will be a five-light traceried window above. The church is being built of Newbridge polled stone, with bath-stone dressings. The building will accommodate between 800 and 900, 700 in nave and transepts and about 140 in a small western gallery. The choir and organ will be raised above the level of the nave. At the rear of the church there are vestry, session-room, manager's room, and choir-room. The architects are Messrs. Habershon, Fawckner, & Groves, Newport and Cardiff, and the contractor is Mr. James Allan, Cardiff.

WESLEYAN CHURCH, TWICKENHAM. — Christ Church, Twickenham, was opened recently in the Queen's-road. The new building is Gothic in style, and has been built of red brick and Bath stone. The main entrance is by a vestibule. Double doors give access to the church, which is divided into nave and aisles by ornamental iron columns. Wide but shallow transepts have been formed at the pulpit end. A small gallery is placed over the porch, reached by a staircase in the tower, which is surmounted by a spire 80 ft. high. Sittings are provided for 600. The windows are all glazed with tinted lead glazing, the heating is by hot water, and the gas

fittings are of wrought iron. The architect was Mr. Charles Bell, of London, and the builders were Messrs. Aries & Co., of Putney. The total cost has been 4,200*l.*

ADDITIONS, ALL SAINTS' CHURCH, HULL.—The Archbishop of York (Dr. Maclagan) visited Hull on the 20th inst. for the purpose of dedicating a new peal of bells given to All Saints' Church, Hull, by Mrs. Foster Earle, in memory of her late husband; and a new vestry, which has been built on the south side of the chancel. The new vestry is of red brick. The architects for the work were Messrs. Brodrick, Lowther, & Walker. The contractors for the building were Messrs. Robinson & Johnson, of Hull.

CONGREGATIONAL CHURCH, EASTBOURNE.—The foundation-stones have just been laid at Eastbourne of a new Congregational Church. The new building, which will be erected by Mr. J. Martin, in accordance with plans prepared by Messrs. Spurrell & Murray, will have a length over all of 78 ft., and a width of 46 ft., and will afford seating accommodation for 450 persons. It will be Early Gothic in style, and the walls of the interior will be panelled with pine for a height of 6 ft., the remainder of the walls being in red brick and plaster. The nave columns will be polished granite. The accommodation will comprise an organ chamber, and on either side of the vestibule cloak-rooms are provided. The church will have an open timber roof. It is also proposed as soon as possible to add a vestry, kitchen, &c.

CONGREGATIONAL CHAPEL, GOWERTON, GLAMORGANSHIRE.—The congregation of the English Congregational Church at Gowerton are building a new chapel to seat 360 worshippers, the contract being 990*l.*, and Mr. Councillor W. Williams, of Landore, being the contractor, and Mr. D. L. Jones, of Llanelly, the architect.

CHURCH, DALTON, KIRKBY RAVENSWORTH, YORKSHIRE.—A new church for the village of Dalton has just been consecrated. The architecture is fourteenth century in style, and the building is of stone, roofed with red flat Staffordshire tiles. The work has been executed by the contractor, Mr. Harwood, of Manfield, to the plans of Messrs. Hicks & Charlewood, architects, of Newcastle.

CONSECRATION OF ST. PATRICK'S CHURCH, NEAR SHIRLEY, WARWICKSHIRE.—This church was re-opened on the 21st inst., having been almost rebuilt. The only existing portion of the previous church is the tower, a new nave and chancel having been built. The work of renovation is not yet complete, portions of the tower having yet to be restored. The architect is Mr. Bidlake, of Birmingham; and the contractors are Messrs. Smith, of Leamington. The building will accommodate nearly 300 people.

NEW PUBLIC SCHOOL, ABERDEEN. — Contracts have been accepted by the Aberdeen School Board, from local tradesmen, for the erection of a new public school at Mile-end, Stocket. The school will be a three-story building of grey granite, the main elevation being to Gordondale-road. The total cost will be about 12,000*l.* The architect is Mr. A. H. L. McKinnon, Aberdeen.

BOARD SCHOOL, WHITCHURCH, GLAMORGANSHIRE.—A new Board school has just been opened at Whitchurch. The architect was Mr. Williams, of Cardiff, and the builder, Mr. John Evans, of Whitchurch.

HOTEL, MANCHESTER.—The hotel which the Midland Railway Company is erecting in Manchester, and which will be known as the Hotel Midland Grand, is in close proximity to the Central Station. Covering an area of about two acres, it is bounded on its four sides by Peter-street, Mount-street, Windmill-street, and Lower Mosley-street. The main front of the building will be in Peter-street, and two archways will admit to a central courtyard, a similar exit being at the opposite side in Windmill-street. Red and grey Aberdeen granite, with a mixture of Shap granite, will be used in the lower part of the structure, while in the upper portion brick and faience will be employed. The section to be first completed will include a concert hall. There will also be public rooms, a winter garden, a rotunda, a roof garden, a French restaurant, business and stock-rooms, Royal and private suites, and 400 bedrooms. Mr. Charles Trubshaw, of Derby, is the architect for the building. The first contract, amounting to 80,000*l.*, has been let to Messrs. William Brown & Son, of Salford, who have been at work upon the section entrusted to them for some months. It is stated that the company will erect the building in four sections, of which that at the corner of Lower Mosley-street and Windmill-street has been first taken in hand.

BRADFORD MARKET EXTENSIONS.—Plans and instructions have been issued to Bradford architects by the City Surveyor (Mr. J. H. Cox), with the view to competitive plans being sent in for the extension of the city markets. The plans, in addition to showing the extension of the market buildings, provide for the widening of John-street and Rawson-place. The street frontages will be occupied by shops, with dwelling-houses over, and at the corner of Rawson-place architects are required to provide accommodation suitable for a licensed house. Underneath the market will be cold storage and ordinary cellarage, to be reached by steps, and also by hydraulic lifts. The work is expected to cost 20,000*l.*

CO-OPERATIVE BUILDINGS, GUARDBRIDGE, N.B.—New co-operative buildings are to be erected at Guardbridge. Mr. Anderson, St. Andrews, is the architect, and the estimated cost is 1,500*l.*

MEMORIAL INSTITUTE, LIVERPOOL.—Mr. Samuel Smith, M.P., is erecting an institute building at Liverpool as a memorial to his late son, Mr. Gordon Smith. The institute will be erected on a site near the Sailors' Home, Paradise-street, and is to be a stone and terra-cotta building, with a tiled roof. On the ground floor will be reading-rooms and library for seamen; hall, 52 ft. by 33 ft.; a second hall, to be called "The Strangers' Rest," in which will be placed literature in various languages; several smaller meeting-rooms, lavatories, and service-room. On the upper floor are to be officers' reading and retiring rooms, another meeting hall, class-rooms, board and superintendent's rooms, lavatories, &c. Mr. James Strong, of the firm of Messrs. Walker & Strong, is the architect.

SHELTER FOR WOMEN, ANCOATS, MANCHESTER.—A new women's shelter was opened on the 20th ult. in connexion with the Manchester and Salford Wesleyan Mission. It is erected on a plot of land containing 213 square yards, with a frontage of 90 ft. to George Leigh-street, Ancoats, and 20 ft. to Great Ancoats-street. The building is four stories high, and is divided into three separate departments, one of which is to accommodate the casuals, another to be used as a servants' home, and the third for the purpose of a temporary home. There are also a coffee tavern and dining-room, which will be worked by the girls of the temporary home. There are sixty-three cubicles giving accommodation to the various departments. Day-rooms, kitchens, and laundry are provided. The buildings are lighted with electricity. The whole of the work has been carried out from the designs of Mr. Walter R. Sharp, of Manchester.

ROPE WORKS, PUTNEY.—A large rope and twine manufactory has just been established not far from the old Baltre Wharf, Putney. The architect is Herbert Hillier, of Westminster; and the builders are Messrs. Kingerlee & Sons, Oxford; the foreman being Mr. Joseph Maycock. The total cost of the works is about 50,000*l.*

TECHNICAL INSTITUTE, NORWICH.—The foundation stone of Norwich Technical Institute was laid on the 17th inst., in St. George's-street. The building was illustrated and described in our issue for January 21 last. The architect is Mr. A. E. Collins, City Engineer, assisted by Mr. W. Douglas Wiles. Mr. S. Warburton is the contractor.

THEATRE, WALSALL.—It is proposed to erect a theatre, to be styled Her Majesty's Theatre, on a site in Park-street and Wolverhampton-street, Walsall. The building will be carried out in red Ruabon bricks with stone dressings, the elevation to Park-street being surmounted by a dome. Shops will be arranged on either side of the principal entrance in Park-street. The interior accommodation will consist of orchestra and pit stalls, pit, circle, balcony, and gallery, together with eight private boxes. The auditorium will be 69 ft. long and 60 ft. wide. The architects are Messrs. Owen & Ward, of Birmingham.

NEW BUILDINGS IN NORTH BRIDGE-STREET, EDINBURGH.—At the Edinburgh Dean of Guild Court, on the 20th inst., a warrant was given to Mr. John White for the erection of new buildings on the east side of North Bridge-street. These buildings will extend from the south abutment of the North Bridge to the Commercial Bank buildings at the corner of the High-street. From Jeffrey-street there will be nine stories, and there will be six stories above North Bridge-street. The street floor on the North Bridge level will be devoted to shops. A special feature will be a large bon marché, entering from North Bridge-street, which will occupy the whole of the centre block on the five floors above the bridge level. This bon marché will also occupy the whole of the second floor below the bridge, and the floor on the level of Jeffrey-street, except a small portion at the north-east corner. The remainder of the upper floors will be devoted to an hotel, the entrance to which from North Bridge-street will be by means of a balcony along the north elevation. There will be a restaurant on this level, and on the Jeffrey-street level there will be another restaurant, which will also be in connexion with the hotel. The lower floors of the buildings will obtain good light from Carrubber's Close and Jeffrey-street. Messrs. George Beattie & Son are the architects. The buildings will probably cost about 170,000*l.*

THEATRE, DOUGLAS, ISLE OF MAN.—The plans for converting The Pavilion (facing the Harris Promenade) into a theatre have been passed by the Committee of the Douglas Town Council which has charge of such matters. Mr. Frank Matcham is the architect.

HISTORIC MAP OF BATH.—This is a second edition of the map of Bath prepared by Mr. T. Sturge Cotterell (published at the *Bath Chronicle* office), showing the houses which have been occupied by various celebrated persons. A good deal of fresh information has been added.

SANITARY AND ENGINEERING NEWS.

THE NEW GLASGOW BRIDGE.—For more than three years operations have been going on in connexion with the rebuilding of Glasgow Bridge. The Town Council of Glasgow took up the matter in earnest in 1892, when they obtained an Act of Parliament to enable them to remove the bridge and to erect a new one in its place, but much had to be done before the scheme could be carried out. A temporary bridge had to be erected to carry the enormous traffic which passes over the river at the place, and this was done at the cost of about 13,000*l.* For various reasons it was resolved to build the new bridge practically with the same elevation as the old bridge, one reason being that the granite piers could be re-dressed and replaced on the new bridge, but as a matter of fact the whole of the new bridge is of granite, the arches being of granite throughout and the piers faced with the same stone. The most difficult and most expensive part of the work was in obtaining a proper foundation. All the piers and the abutments have been carried down to a depth of about 60 ft. below low water level, and from 20 ft. to 30 ft. below the foundations of the quay walls along the Clyde. The foundations were sunk under pneumatic pressure by means of steel cylinders, having an air-tight chamber at the bottom, in which the workmen dug out the excavations, while the cylinders were sunk by being gradually filled up with concrete, the superincumbent weight forcing the cylinders down as the excavations were removed. Each pier is supported by four cylinders, each 15 ft. diameter, these being connected with each other at low water level by semi-circular granite arches on which are built the solid piers which support the main arches. The abutments and wings are also supported by cylinders, those for the abutments being similar to those for the piers, but those for the wings being considerably smaller and built of brickwork instead of steel and concrete. One of the main features of the new bridge will be the parapets, which are of polished granite throughout. The pediments surmounting the piers of the old bridge were rather insignificant, and served merely as bases for gas lamps. These have been superseded by elaborate moulded and polished granite pediments rising considerably above the level of the parapets on the arches. No provision has been made on them for lamps, as the whole lighting of the bridge is to be carried out by means of a row of electric lamps placed along the centre of the carriageway. The new bridge is 80 ft. wide between the parapets. The footpaths on either side are 15 ft. wide, and the carriageway 50 ft. A double line of tramway occupies the centre, and there is on each side ample room for a double line of ordinary street traffic between the tramway rails and the kerb. Provision has been made on the bridge for a large number of pipes, including two 27-in. water pipes, two 24-in. gas pipes, and a whole array of smaller pipes connected with the hydraulic pressure, electric lighting, electric traction, telegraphs, and telephones. The bridge will be opened for traffic during the summer. The engineers of the bridge are Messrs. Blyth & Westland, Edinburgh; the contractors are Messrs. Morrison & Mason, Glasgow; and the whole of the new granite has been supplied by Mr. John Fyfe, Aberdeen.—*Scotsman.*

NEW WATER SUPPLY FOR NEWTON-ON-THE-MOOR, NORTHUMBERLAND.—Earth works and other operations have been commenced by Messrs. J. & G. Green, of Warkworth, for the construction of an open storage reservoir to hold 100,000 gallons of water to supply the village of Newton-on-the-Moor. Mr. William Henderson is clerk of the works, and the plans have been prepared by Mr. M. Temple Wilson, architect and surveyor, Alnwick.

DONCASTER RURAL DISTRICT. — The Doncaster Rural District Council intend carrying out schemes of main sewerage and sewage disposal for Bawtry, Askerne, Bentley, and Arksey, and have instructed Messrs. D. Balfour & Son, of Westminster and Newcastle-on-Tyne, to prepare plans, estimates, and reports; also to inspect and report on the Conisburgh and Denaby sewage disposal scheme.

CRANBROOK DISTRICT SEWERAGE. — At the last meeting of the Cranbrook Rural District Council the plans for the sewerage and sewage disposal for the district of Hawkhurst prepared by Messrs. Sands & Walker, of Nottingham, were approved, and application is to be made to the Local Government Board for sanction to the necessary loan for carrying out the works.

FOREIGN.

FRANCE.—At the Gobelins the tapestries designed by M. Charles Garnier for the library of the Paris opera-house are in progress. They are ornamented with harps, lyres, and other decorative *motifs*, and their design was one of the last things Garnier executed.——A new hotel for the Sous-Prefecture is to be erected at Bastia, Corsica, close to the sea. ——The joint Salon exhibitions will open on Monday May 1, in the Galerie des Machines, as last year. The general arrangement is much the same as last year, but in the old Salon section the exhibition of engravings has been given up, and

a room for decorative art has been allotted to the architectural section.——An exhibition of the works of Puvis de Chavannes is in course of arrangement at the Galliera Museum. It will be opened in the course of next month. —— The Municipal Council of Paris has voted a sum of 600,000 francs for the erection of a special pavilion for the municipal exhibits at the 1900 Exhibition. It will be on the right bank of the Seine, near the Pont Alexandre III., and will be designed in French Renaissance style. M. Gravigny is the architect. ——The death is announced, at the age of thirty-seven, of M. René Bazelin, architect, of Paris; a member of the Société Centrale. and a former pupil of M. Guadet. He obtained the premium in 1889 in a competition opened by the Town Council of Limeil-Brevannes for a block of new schools. ——The death is announced also of M. Duhaupas, architect, of Paris.

THE NEW RUSSIAN CHURCH IN VIENNA.—On Sunday, April 16, was consecrated the striking new Russian Church of the Vienna Embassy. The church has been built on a site belonging to the Embassy, and the cost defrayed by a grant of the late Emperor Alexander III. The work has been carried out by a Vienna architect, the Chevalier Giacomelli, from designs by M. Kotow, of the Russian Academy at Moscow. It occupies an area of about 1,000 square yards, and has a height of 170 ft. The style is Russo-Byzantine, the great crucifix on the central tower being ornamented with a sparkling circle of rock crystals, which in the sun scintillates with all the colours of the rainbow. The images in the interior are the work of two Russian artists, MM. Bruni and Kharlamoff. The photograph of the building, which has been sent to us, shows a sufficiently barbaric-looking edifice, with a sixteen-sided central lantern with high conical roof crowned with one of those huge bulbous finials characteristic of Russian architecture; similar bulbous finials surround it on a lower level. The building must furnish an odd contrast to the predominating character of modern Vienna architecture.

SINGAPORE.—At the beginning of the present year the Committee of the New Teutonia Club advertised for designs for a new Club House to be built upon the site of the present building in Scott's-road. There was no premium offered, but the committee undertook to employ the successful architect to carry out the work at the usual commission, which is 10 per cent. Several architects responded, and subsequently the design submitted by Messrs. Swan & Maclaren was accepted, that of Messrs. Lermit & Westerhout being placed second. Architects were informed that the building was to be on the bungalow principle, the floor to be raised several feet from the ground, the accommodation to be provided comprising a ball-room at least 80 ft. by 40 ft., with large stage at one end with dressing-rooms, scene-rooms, &c., reading-room, billiard-room, refreshment-room, with large room for lounge next bar, and lavatories, dressing-rooms, &c., the whole to be surrounded with a wide verandah and approached through a hall with carriage porch in front. The site was on a spur of a hill, and the successful architects have planned their building to suit this, making their plan L-shaped to avoid earth cutting. The entrance-hall, approached from a large porch up a very wide flight of granite steps, is octagonal on plan, and is placed at the angle of the L, the porch being placed at an angle of 135 deg. with the sides. The hall, which is 60 ft. in diameter, has an arcade 10 ft. wide running round the inside with attached columns at the angles supporting a gallery some 20 ft. above floor level. The whole of the hall will be paved with local marble from Perak, and it is intended to line the walls with coloured marbles from the same quarries. These quarries have been recently started, and are producing marbles of all shades and of first quality. Off the hall a staircase leads to the gallery. The centre part of hall is continued up forming an octagonal tower, with a steep-pitched roof, terminated with a timber ventilator with copper roof. This can be approached by a small staircase. Coming to the main floor again, on the left of the hall immediately near the entrance are ladies' cloak-rooms projecting in front of the general line of the building. The ball-room is on the left of the hall, is 90 ft. by 42 ft. and 40 ft. high, with a stage at the farther end, and a musicians' gallery at the entrance end. The interior is treated with a deep dado of red marble, with numerous doors of large size (so necessary in the tropics); above which is a moulded band supporting attached columns with deep frieze and cornice; the space between the columns to a depth of 4 ft. below the architrave is filled with ventilating lights between stumpy columns. The ceiling is of local hardwood, panelled and coppered. At the side of the stage are dressing-rooms, &c. In the other wing are the billiard-room, reading-room, and refreshment-room, with lavatories, &c., and a gentlemen's cloak-room is provided near the entrance. The interior treatment is similar to the ball-room. All round the building are verandahs 12 ft. wide. The architectural treatment of the exterior is good, plain late English Renaissance, the main walls being carried above the roof of verandah and finished with a heavy wooden cornice, under which are the ventilating lights between the columns. The verandah is divided up with columns, and has a deep, wood cornice, with a lean-to roof, covered with segmental red tiles, but at each end the cloak-rooms are brought forward and carried up the full height of main walls, the upper part being used as card-rooms. They are treated plainly below, but finished with attached columns, with cornice and semicircular pediment, broken by windows, and filled with carving. The building is mainly of red brick and stucco quoins, &c., marble being introduced in places. The roofs generally are of segmental red tiles, but the steep roof of the tower is to be hung with teak shingles. The tower is very plainly treated in red brick, and rough-cast with stucco cornices, and every part of the tower has its use. The whole of the timber used will be local hardwood, and a certain amount of teak. Tenders are now being called for, and the work is expected to be completed early next year. The site is a fine one, as it stands at a considerable height above the road level, and below are nice grounds, with tennis-courts, &c.——Jubilee Town Hall.—Nothing has been done so far to advance this project since the award was made nearly a year ago, except that it is rumoured that the committee have decided to abandon the site pointed out to competitors, and are negotiating for a site on the side of Fort Canning, and have been busy boring on the side of the hill to see, presumably, if the foundations are good.

MISCELLANEOUS.

GOVERNMENT WORKS.—The Committee of Supply in the House of Commons has sanctioned the following estimates for works to be carried out in the course of the current financial year:—Buckingham Palace: continuation of installation of electric light (total cost 11,000*l.*), 2,500*l.*; improvement of ventilation, 200*l.* Royal Mews, Pimlico: warming arrangements in State harness-rooms, coach-houses, &c., 250*l.*; alterations to coach-houses, 150*l.* Windsor Castle: installation of electric light (total cost uncertain), on account, 2,000*l.*; ventilation of the kitchen, 200*l.* Windsor Royal kitchen garden: construction of fruit room, 200*l.* Kensington Palace: restoration of State rooms and banqueting house (total cost, 23,000*l.*; expended to March 31, 1899, 21,000*l.*), to complete, 2,000*l.* Hampton Court Palace: alterations to barracks for improvement of main entrance to Palace, 2,700*l.* Holyrood Palace: granolithic paving, 250*l.* Various palaces: improvements for better protection against fire, 2,250*l.* Marlborough House: alterations in courtyard, 200*l.* Bushy Park: new stable, tool shed, &c., 200*l.* Greenwich Park: improvements and public conveniences, 500*l.*; alterations to Superintendent's lodge, 200*l.*; new footpath (500*l.*), on account, 250*l.* Hampton Court Gardens: new hot-house, 500*l.* Kensington Gardens: new public conveniences and consequent alterations, 500*l.* Kew Gardens: new filter bed, 2,700*l.*; additions to boilers, 135*l.*; experimental well near river, 200*l.*; new mess-room for workmen, 160*l.*; new frame for Alpine plants, 120*l.*; new span frame in melon ground, 125*l.*; new frame in nursery, 125*l.*; new stables for director, 200*l.*; alterations in works depôt, 150*l.*; Queen's cottage grounds, fencing, 300*l.* Regent's Park: addition to greenhouses, 300*l.*; stable and workmen's mess-room, 200*l.* Richmond Park: improving Roehampton entrance and rebuilding lodge, 900*l.* St. James's, Green, and Hyde Parks: further improvements in lighting roads and footpaths, 1,000*l.*; wood-paving between Marlborough and Buckingham Gates, 4,000*l.* Houses of Parliament: construction of hydraulic lift in Speaker's residence, 1,000*l.*; reconstruction of members' staircase to the terrace, 500*l.*; fitting up and furnishing as a committee room part of the house vacated by the librarian of the House of Lords, 700*l.*; works in connexion with the flues in the speaker's residence, 200*l.*

THE SANITARY INSTITUTE EXAMINATION.—At an examination in practical sanitary science, held at Birmingham, on April 14 and 15, five candidates presented themselves. The following candidate was granted a certificate in practical sanitary science:—G. S. Taylor, Moseley, Birmingham. At an examination for inspectors of nuisances, held at Birmingham, on the same dates, twenty-nine candidates presented themselves. The following seventeen candidates were certified, as regards their sanitary knowledge, competent to discharge the duties of inspectors of nuisances under the Public Health Act, 1875:—A. E. Adcock, West Bromwich; S. Baylis, Nechells, Birmingham; F. R. Bioletti, Birmingham; G. H. Brayshaw, Bradford; J. Dyson, Middleton; E. J. Franklin, Cheltenham; J. W. Gaskell, Hollinwood, Oldham; P. Gray, Bolton; W. S. Hart, Edgbaston, Birmingham; C. J. Humphreys, Birmingham; F. W. Kelway, Bath; W. Parsons, Leamington; A. O. Purnell, Lozells, Birmingham; T. K. Ramsey, Market Drayton; W. R. Smedley, Selly Oak, near Birmingham; I. Stephens, Burton-on-Trent; J. Wood, Illingworth, Halifax.

CRYSTAL PALACE SCHOOL OF ENGINEERING.—The certificates awarded by the examiners for the Easter term of the Crystal Palace Company's School of Practical Engineering were presented on the 21st inst., in the Lecture Theatre of the school. Sir John Jackson took the chair. Mr. R. G. Hodson, Superintendent of the Crystal Palace School of Art, Science, and Literature, read the lists of awards and the reports of the examiners, which were of a satisfactory character. Before presenting the certificates, Sir John Jackson said he was delighted with what he had seen in the school, particularly in the mechanical workshops. In his opinion, no engineer had had a sufficient training unless he had spent a considerable time in workshops or on works in progress. He (the chairman) spent three years in an engineering factory before taking the civil engineering course in Edinburgh University. He had always looked upon those three years as a most useful training. Those who would have to do with workmen in later life would find workshop experience important. But on the whole, perhaps, it was better to get the workshop training in a school like this at the same time that they were getting their class-room training. For the encouragement of the students, the Chairman stated that when he was twenty-five years of age he was entrusted as contractor with the making of a dock, costing from two to three hundred thousand pounds, while at thirty-five he undertook what was considered the somewhat difficult work of putting in the foundations of the Tower Bridge. He mentioned this because people often said that an engineer never did anything before he was forty or forty-five years old. He was now engaged in the construction for Government of the largest dock in England or the world—the Keyham extension dock—and he should be glad to have the works visited by the students of the school. Mr. J. W. Wilson, Principal of the School, remarked that many old students had posts in Africa, and that one of them was engaged in carrying out Mr. Cecil Rhodes's transcontinental telegraph line.

ABERDEEN MASTER MASONS' ASSOCIATION.—The members of this Association have resolved not to tender as sub-contractors for the mason work of the new post office at Aberdeen, and as the Government have declined to alter the system of letting the whole work to one contractor, the outcome is awaited with interest. In the meantime, it is also reported that Government have accepted the offer of an Inverness builder (Mr. Thomas Macdonald) for the erection of additions to Aberdeen Military Barracks, Justice-street, at a total cost of 3,000*l.*

BISHOP LLOYD'S PALACE, CHESTER.—On the 18th inst., Mr. Alderman Charles Brown, of Chester, invited a small company to view Bishop Lloyd's Palace, one of the most interesting old buildings in Chester, situated in Watergate-street, which Mr. Brown has recently purchased. The attendance included Archdeacon Barber and members of the Chester Archæological Society. The front of the building bears the initials "I.R." (Jacobus Rex), and its date has been fixed at 1603. Bishop Lloyd became Bishop of Chester in 1604, and died in 1615, being buried in Chester Cathedral. The interior of the palace contains some remarkable panelling in a good state of preservation. Mr. Brown said there was a danger recently of the building being sold to an American syndicate, and he had bought it with a view of preserving such an interesting relic. The restorations will be carried out by Mr. Lockwood, architect, Chester, with due care not to mar any of the archæological features of the building.—*Liverpool Post.*

THE PHYSIC GARDEN, CHELSEA.—In terms of a scheme prepared by the Charity Commissioners (of which we lately published an abstract) the garden is now committed to the trustees of the London Parochial Charities, who will apportion a yearly sum of 800*l.* towards its maintenance. The garden, which covers about three and a half acres, will henceforth be devoted to the study of botany and vegetable physiology, and the culture of medical plants for instruction in technical pharmacology. The garden had its origin in the parcel of land which the Company of Apothecaries leased from Lord Cheyne in 1673 for their barge-house and the culture of medicinal herbs. Having bought the manor of Chelsea in 1712, Sir Hans Sloane gave the freehold of their garden to the Apothecaries under certain conditions as to its maintenance, in the year 1722. In 1893 the company applied to the Charity Commissioners for relief from their trusteeship, which made a too heavy demand upon their resources. William Aiton, whom we mentioned in our recent account of the history of Kew Gardens, was a pupil of Philip Miller, author of the "Gardener's Dictionary," and head gardener to the Company during nearly fifty years. Miller died in 1771 and was buried in the graveyard of old St. Luke's, Chelsea, wherein the Linnæan and Horticultural Societies erected a monument to his memory.

A WASHABLE DISTEMPER.—We have received some samples of "Hall's Sanitary Washable Distemper," manufactured by Messrs. Sissons Brothers, & Co., Limited, of Hull. It should prove useful for many purposes, for it is cheaper than ordinary paint, and yet can be washed without damage three weeks after it has been applied, if the evidence of numerous testimonials can be accepted. The antiseptic ingredient is cresylic acid, and where its odour is not an objection to its employment is doubtless of some sanitary value as a wall-wash. The washable distemper is said to set firmly even on a damp wall, and can be applied to brick, stone, plaster, or glass. For use, 4 lbs. of the distemper are thinned with 1 lb.

of water, and the mixture will cover a surface of about 25 square feet. Those seeking a material superior to ordinary distemper and yet cheaper than paint, will probably find that this washable distemper will meet their requirements. It is, we understand, made up in various tints.

CAPITAL AND LABOUR.

THE BUILDING TRADE DISPUTE AT LOUGHBOROUGH.—A dispute has recently arisen between the master builders of Loughborough and the bricklayers' labourers, the latter of whom demand an increase of wages, and have come out on strike because the terms asked for have not been conceded. The labourers have been receiving 5d. per hour, and the dispute has resulted in throwing 130 men out of employment. The bricklayers still remain at work, and in place of the labourers who have come out the masters have employed a number of "blacklegs." Arbitration has been suggested, but nothing definite has yet been arranged. The Loughborough Trades Council have taken up the cause of the labourers, and recently held a mass meeting in the Philharmonic Hall. Mr. Fred Morley, President of the Trades Council, occupied the chair. During the proceedings Mr. Bruton proposed, and Mr. Kennett seconded, the following resolution, "That this mass meeting pledges itself to use every means in its power to secure for the builders' labourers in Loughborough a living wage." The resolution was carried.

ABERDEEN MASONS AND SETTMAKERS.—It has been agreed that a rise of ½d. per hour be given to operative masons—both hewers and trowel men—making the standard rate 8½d. per hour. The advance will take effect from May 23. Settmakers at the Aberdeenshire quarries have been conceded an advance of ½d. per hour on day work, and from 6d. to 1s. per ton on piece work.

BUILDING DISPUTE AT CARDIFF.—A meeting of the Master Builders' Association was held on the 21st inst. in the offices in Castle Arcade, the members sitting as a conciliation committee, and they met representatives of the carpenters, bricklayers, and operative stonemasons, the two former with respect to the rule of which the masters have given notice relative to walking distance. The carpenters took back the employers' offer to their society, and in the course of a few days will report the result of their deliberations. The bricklayers have decided to agree to the terms of the masters' proposal in their entirety. The operative stonemasons were met last, and the decision of the joint meeting, held on the previous night, was communicated to them—that the employers could not see their way to grant them the advance of ½d. per hour, of which notice had been given, as they considered the application premature and not warranted by the present state of trade, with so many masons out of employment. The masons apply, also, for a reduction of hours—to leave at noon on Saturdays, and to have an hour for dinner all through the year—which the masters are prepared to consider when they act in conjunction with other trades, as it will be extremely difficult for employers, in the ordinary course of business, to permit one section of mechanics to leave off at noon while others continue until one.—*Western Mail.*

BUILDING TRADE DISPUTE, WEST HARTLEPOOL.—The building trade dispute at West Hartlepool led to a serious outrage there on the 24th inst. A builder's labourer, named Jordan, working on a house in Duke-street in course of erection, was followed by two other labourers, with whom he had some words. The pair seized hold of Jordan, and, it is alleged, threw him to the ground, a distance of two stories. The man's leg was badly broken, and he sustained other serious injuries. His assailants are in custody.

STRIKE OF GLASGOW CARPENTERS.—Close upon 3,000 house carpenters struck work in Glasgow on the 20th inst. for another advance for a halfpenny per hour on the present rate of 9½d. The men state that seventy-two firms have already conceded the advance.

WAGES IN THE BARNSLEY (YORKSHIRE) BUILDING TRADES.—The question of wages and rules in the building trades of Barnsley have been under consideration recently. The joiners and their employers have agreed as to the advance of ½d. per hour, and the masons and bricklayers also have agreed as to the advance of ½d. per hour all round. After May 1 joiners and masons will be paid 8½d. per hour, bricklayers 9d. per hour.

LEGAL.

STRUCTURAL ALTERATIONS.

ALLEGED BREACH OF COVENANTS IN LEASE.

IN the Chancery Division of the High Court of Justice, on the 21st inst., Mr. Justice North had before him the case of Peter *v.* The Plymouth Breweries, Limited, on a motion by the plaintiff, Mr. Albert Edward Peter, for an *interim* injunction to restrain the defendants until the trial or further order, and their servants, workmen, contractors, and agents, from in any way altering or interfering with the structure of certain premises known as the Exmouth Hotel, 66, Union-street, East Stonehouse, and from cutting or altering the front or side walls, windows, partitions, or from otherwise committing waste on the premises in such a way as to prevent or prejudice the carrying on upon the premises of the business of a licensed victualler in breach of a lease granted on September 28, 1890.

Mr. Vernon Smith, Q.C., appeared for the plaintiffs, and Mr. Macnaghten, Q.C., for the defendants.

Mr. Macnaghten, said that the question was whether his clients, as tenants of the premises, had committed waste on the premises.

Mr. Vernon Smith said his affidavits went to show that the defendants had caused damage, and that there were cracks in the walls.

Mr. Macnaghten said his evidence was to the effect that these cracks were old.

After some further discussion, his Lordship, at the defendants' request, directed the motion to stand over for a week.

THE RIGHT TO WORK STONE UNDER A RAILWAY.

ON the 24th inst. the case of the Queen on the prosecution of H. E. Walker and A. C. Walker *v.* the London and North-Western Railway Company came before the Court of Appeal, composed of Lords Justices A. L. Smith, Collins, and Romer, for judgment on the appeal of the defendant company from an order of a Divisional Court making absolute a rule for a mandamus requiring them to take up an award made by Mr. Foster Brown in reference to whether the Rugby Portland Cement Company, the plaintiffs, should be allowed to work certain stone for the purposes of their business adjacent to the defendant company's works at Rugby. The plaintiffs, it appeared, gave notice of their intention to work stone under the Railway Company's works, and to this the defendants objected. The matter, therefore, was referred to arbitration, Mr. Foster Brown being the arbitrator. Before him it was claimed, on behalf of the defendants, that the question which he had to deal with must be decided having regard to some private Acts of Parliament passed in 1833 and 1835, under which the railway was constructed and controlled until 1846. A consolidated Act then repealed those private Acts, but the effect of certain of their provisions was reserved. The Divisional Court held that the Railway Clauses Act governed this case, and that the defendant company were bound to submit to its provisions. They therefore made absolute the rule for a mandamus ordering them to take up the award of the arbitrator. The Railway Company now appealed, contending that the provisions of the private Acts governed this case.

By a majority of the Court the decision of the Divisional Court was affirmed (Lord Justice Collins dissenting) and the appeal was dismissed with costs.

A stay of execution was granted for a fortnight with a view to the Appellants lodging an appeal to the House of Lords.

Sir Edward Clarke, Q.C., Mr. E. Page, Q.C., and Mr. A. Underhill appeared for the appellants, and Mr. Dugdale, Q.C., and Mr. Noble for the respondents.

ARCHITECTS' ACTION AGAINST THE MANCHESTER SCHOOL BOARD.

ON the 20th inst. the case of Messrs. Woodhouse & Willoughby, architects, against the Manchester School Board, was heard at the Manchester Assizes before Mr. Justice Bigham and a special jury. Mr. Pickford, Q.C., and Mr. Byrne appeared for the plaintiffs, and Mr. Taylor, Q.C., and Mr. Langdon for the defendants.

The claim of the plaintiffs, who are architects practising in Manchester, was for 120*l.* for work done in connexion with the building of a Board school in Holland-street. The work consisted in measuring up some extras in the building. The defence was that the work was covered by the plaintiffs' remuneration as architects for the building.

The jury found for the plaintiffs for the amount claimed. The Judge refused to certify for a special jury, on the ground that a settlement might easily have been arrived at. Mr. Pickford, on behalf of the plaintiffs, stated that his clients had done all they could to settle the case out of court, but that the School Board had refused to meet them or to refer the matter to an arbitrator.

YORKSHIRE BUILDING DISPUTE.

MANDATORY ORDER GRANTED.

THE case of Jackson *v.* the Normanby Brick Company, Limited, came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Rigby and Collins, on the 26th inst. In November last, the Court reversed a decision of Mr. Justice Kekewich, and made a declaration that the defendants had no right to erect, without the consent of the plaintiff, certain kilns, chimneys, and buildings, on a particular portion of the land leased to them, and of which Mr. Jackson was the reversioner; but their Lordships did not then grant a mandatory injunction, as they thought the parties might be able to come to some arrangement. They were, however, unable to come to terms, and on March 1 application was made for a mandatory order for the defendants to pull down and remove the buildings in question, but the matter again stood over, on an intimation that the defendants intended to appeal to the House of Lords.

Mr. Renshaw, Q.C., on the part of the plaintiff, now mentioned that the intention to carry the case further had been abandoned, and renewed the motion of March 1.

Mr. Warrington, Q.C., did not see his way to resist a mandatory order to pull down the kilns, chimneys, and buildings erected since the commencement of the action without the consent of the plaintiff, but asked that it should not extend to buildings for the erection of which the defendants considered that consent was given before action, although the buildings were not put up till after the writ had been issued.

The Master of the Rolls said he was satisfied that such consent as there was was due to misapprehension. The defendants were accordingly directed to pull down and remove the kilns, chimneys, and buildings they had erected since the commencement of the action, and they were further ordered to pay the costs of this application.

MEETINGS.

FRIDAY, APRIL 28.

Architectural Association.—Mr. F. W. Macey on "Specifications." 7.30 p.m.

Royal Institution.—Professor C. A. Carus Wilson on "Some Features of the Electric Induction Motor." 9 p.m.

Institution of Mechanical Engineers.—Ordinary General Meeting (concluded). Paper by Mr. H. G. V. Oldham. 7.30 p.m.

SATURDAY, APRIL 29.

Architectural Association.—Seventh Spring Visit, to (1) the Church in course of erection in Charlebury-grove, Ealing. 3 p.m. (2) St. Saviour's Church, Grove-road, Ealing.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage Outfall Works, Barking. 3 p.m.

London and Provincial Builders' Foremen's Association (Memorial Hall Farringdon-street).—Monthly Meeting. 7.30 p.m.

Northern Architectural Association.—Visit to Ryton and Newburn Churches.

MONDAY, MAY 1.

Royal Institute of British Architects. — Annual General Meeting. 8 p.m.

Surveyors' Institution.—Discussion on the "Agricultural Holdings Bill" prepared and brought in by Mr. Channing and others. 8 p.m.

Society of Engineers.—Mr. J. D. Roots on "Petroleum Motor Vehicles." 7.30 p.m.

Liverpool Architectural Society. — Annual General meeting. Closing Address by the President, Mr. W. E. Willink. 6 p.m.

TUESDAY, MAY 2.

Sanitary Institute.—Annual dinner at the Whitehall Rooms. 7 p.m.

Royal Institution.—Professor Silvanus P. Thompson on "Electric Eddy-Currents." I.—3 p.m.

Society of Biblical Archæology.—Mr. F. Legge, on "Recent Discoveries at Abydos and Negadah." 4.30 p.m.

Glasgow Architectural Association.—Mr. T. Ramsay on "The Electric Lighting of a Modern Building."

WEDNESDAY, MAY 3.

Society of Arts.—Mr. W. H. Preece, C.B., F.R.S., on "Ætheric Telegraphy." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

Royal Archæological Institute.—The Rev. W. G. Clark-Maxwell on "Roman Towns in the Valley of the Baetis." 4 p.m.

Edinburgh Architectural Association.—Annual business meeting and President's valedictory address. 8 p.m.

THURSDAY, MAY 4.

Carpenters' Hall, London Wall (Lectures on Carpentry and Joinery).—Mr. F. R. Farrow on "Strength and Strains in Wood." 7.30 p.m.

Royal Institution.—Mr. Lewis F. Day on "Embroidery." I. 3 p.m.

Iron and Steel Institute.—Annual meeting, to be held at the Institution of Civil Engineers, Westminster. 10.30 a.m.

Society of Antiquaries.—8.30 p.m.

Institution of Electrical Engineers (to be held at the Society of Arts, John-street, Adelphi).—Mr. P. V. McMahon on "Electric Locomotives in Practice and Tractive Resistance in Tunnels with notes on Electric Locomotive design." 8 p.m.

FRIDAY, MAY 5.

Royal Institution.—Mr. W. J. Russell, Ph.D., F.R.S., on "Pictures produced on Photographic Plates in the Dark." 9 p.m.

Iron and Steel Institute.—Annual meeting (concluded). 10.30 a.m.

Institution of Junior Engineers.—8 p.m.

SATURDAY, MAY 6.

British Institute of Certified Carpenters.—Meeting at Carpenters' Hall at 6 p.m. Lantern lecture on "Timber and Timber Trees" by Mr. J. Hedson Davies.

Edinburgh Architectural Association.—Visit to Peebles: (1) Neidpath Castle; (2) Cross Church; (3) St. Andrew's Tower.

PRICES CURRENT OF MATERIALS:

WOOD.*

Per Petersburg standard hundred.

	£	s.	d.	£	s.	d.
White Sea: first yellow deals	17	0	0	18	0	0
Second do.	13	5	0	14	15	0
Third do.	10	15	0	11	15	0
Battens, 40s., 30s., and 15s. less respectively.						
Petersburg: first yellow deals	11	15	0	14	5	0
Second do.	10	15	0	12	5	0
Battens, 30s. and 20s. less respectively.						
Petersburg, white deals	9	15	0	11	15	0
Do. white battens	7	10	0	9	0	0
Riga, white deals	8	5	0	9	5	0
Swedish mixed yellow deals	13	5	0	16	15	0
Third do.	12	5	0	14	5	0
Fourth do.	10	15	0	11	15	0
Fifth do.	9	15	0	10	15	0
Battens, 30s., 20s., and 10s. less respectively.						
Whitewood, 10 to 20 per cent. less.						
Finnish unsorted yellow deals	9	15	0	10	5	0
Battens, 10s. and 5s. less respectively.						
Whitewood, 5 to 10 per cent. less.						
Norwegian second yellow battens	7	10	0	8	10	0
Third do.	7	0	0	8	0	0
Fourth do.	6	10	0	7	10	0
Whitewood, 10s. less.						
Danzig, Crown Deck deals, per 40 ft. 3 in.	0	15	0	1	5	0
Brack	0	12	0	1	0	0
St. Lawrence Pine deals, &c., per P.S.H.:—						
1st, Bright and Dry, regular sizes	18	15	0	25	5	0
,, ,, oddments	11	15	0	18	10	0
2nd ,, regular sizes	13	15	0	17	0	0
,, ,, oddments	9	5	0	12	15	0
3rd ,, regular sizes	9	0	0	10	0	0
,, ,, oddments	6	15	0	8	5	0
4th ,, regular sizes	6	0	0	7	0	0
,, ,, oddments	5	10	0	6	10	0
St. Lawrence Spruce deals, &c.						
First, regular sizes	8	5	0	10	5	0
Second ,,	7	5	0	8	5	0
Third ,,	7	0	0	7	15	0
Fourth ,,	5	15	0	6	15	0
Oddments and battens at 20s., 10s., 7s. 6d., and 5s. less respectively.						
New Brunswick Spruce deals, &c.	7	0	0	7	15	0
Oddments, battens, and fourths	6	5	0	7	5	0
United States pitch pine planks and boards	9	5	0	12	15	0
Prepared Boards, per square						
1¼ by 6½ and 7 in. 1st yellow		12	0		15	3
,, ,, 2nd ,,		10	6		12	3
1 by 6½ and 7 in. 1st ,,		9	0		11	3
,, ,, ,, white		8	6		9	3
,, ,, 2nd yellow		8	6		10	3
,, ,, ,, white		7	0		7	9
¾ by 6½ & 7 in. 1st & 2nd yellow		7	9		8	6
,, ,, ,, white		7	3		8	0
¾ by 6½ and 7 in. 1st yellow and white (grooved, tongued, and beaded)		6	9		9	3
¾ by 6½ and 7 in. 2nd yellow and white (ditto)		5	9		8	0
⅝ by 6½ and 7 in. 1st yellow and white (ditto)		5	9		6	6
⅝ by 6½ and 7 in. 2nd yellow and white (ditto)		5	3		6	0
Narrower widths at 10 per cent. less. 3rd quality at 15 per cent. less than 2nd.						
Danzig and Memel Fir Timber— per load						
Best middling	2	10	0	3	10	0
Good middling and Second	2	0	0	3	5	0
Common middling	1	10	0	2	10	0
Undersized	1	10	0	1	15	0
Swedish and Norwegian Balks	1	5	0	1	15	0
Baltic Oak Timber—						
Danzig and Stettin—Large	3	10	0	4	0	0
Small	2	0	0	2	5	0
Quebec Timber per load						
Yellow Pine	4	10	0	6	5	0
Oak	4	5	0	6	5	0
Elm	4	15	0	5	15	0
Ash	4	0	0	5	5	0
Birch	3	10	0	5	10	0
New Brunswick, &c., Birch	2	5	0	3	0	0
American Pitch Pine Timber	2	14	0	3	3	0
Wainscot, per log, 18 cubic ft.—						
Crown (Eng. & Dutch) } nominal	4	10	0	6	5	0
Brack } nominal	3	15	0	4	15	0
Lathwood, per cubic fathom—						
Petersburg	4	0	0	6	10	0
Riga and Danzig	4	10	0	5	10	0
Norway Poles, per ft. run	0	0	1	0	0	1½
Oak Staves, per mille full size pipe						
Memel, Crown	210	0	0	220	0	0
Brack	180	0	0	190	0	0
Danzig	265	0	0	275	0	0
Bosnia, single Barrel (nominal)	28	0	0	30	0	0
United States, Pipe	35	0	0	42	10	0
Hogshead, extra heavy and double extra	27	10	0	32	10	0
Indian Teake per load	11	15	0	16	15	0
British Guiana Greenheart	0	0	0	8	0	0
Mahogany, per foot superficial—						
Honduras, cargo average	0	0	4½	0	0	6
Nicaragua, do.	0	0	4¼	0	0	5½
Tabasco, do.	0	0	4	0	0	6½
Mexican, do.	0	0	3½	0	0	4
Panama, do.	0	0	3	0	0	4
African, do.	0	0	3½	0	0	5
Cuba, do.	0	0	5½	0	0	7½
St. Domingo, do.	0	0	5	0	0	7
Do. Curls (good to prime)	0	0	9	0	1	3
Walnut, American (logs)	0	2	0	0	4	6
Do. do. (planks and boards)	0	2	0	0	7	6
Italian, per foot superficial	0	0	3	0	0	7½
Black Sea, per ton	6	0	0	12	0	0
Satin Walnut (logs) per foot cube	0	1	0	0	1	3
,, ,, (planks and boards)	0	2	0	0	2	9
Sequoia (Californian redwood), per foot cube	0	1	9	0	2	0
Whitewood, American (logs)	0	1	3	0	1	6
,, ,, (planks and boards)	0	1	6	0	2	9
Quartered oak ,, ,, ,,	0	2	3	0	4	0
Kauri pine (logs)	0	1	9	0	2	0
,, ,, (planks)	0	2	3	0	2	9
Jarrah (planks)	0	2	3	0	2	6
Lancewood spars each, fresh and large	0	7	0	0	10	0
Lancewood spars, ordinary to fair	0	4	0	0	6	0
Degame spars	0	8	0	0	12	6

* The prices for wood are shipping; prices. Ten per cent., approximately, should be added in order to arrive at the current trade prices.

METALS.

	£	s.	d.	£	s.	d.
IRON—Pig, in Scotland ton	2	19	1½	0	0	0
Bar, Welsh, in London	6	0	0	6	5	0
Do. do. at works in Wales	5	15	0	5	17	6
Do. Staffordshire, in London	6	5	0	7	10	0
COPPER—British cake and ingot	79	10	0	80	0	0
Best selected	80	0	0	81	0	0
Sheets, strong	82	0	0	85	0	0
Chili bars	77	7	6	0	0	0
YELLOW METAL lb.		7d.			7½d.	
LEAD—Pig						
Spanish ton	14	10	0	0	0	0
English Com. Brands	14	15	0	0	0	0
Sheet, English, 6 lbs. per sq. ft. and upwards	15	15	0	0	0	0
Pipe	16	5	0	0	0	0
ZINC—English sheet ton	30	0	0	0	0	0
Vieille Montagne	31	0	0	0	0	0
Spelter	28	10	0	29	0	0
TIN—Straits	115	12	6	0	0	0
Australian	115	12	6	116	0	0
English Ingots	118	5	0	119	0	0
Banca	114	0	0	0	0	0
Billiton	113	0	0	0	0	0

OILS.

	£	s.	d.	£	s.	d.
Linseed ton	17	12	6	0	0	0
Cocoanut, Cochin	29	10	0	0	0	0
Do. Ceylon	25	15	0	0	0	0
Palm, Lagos	24	10	0	0	0	0
Rapeseed, English, pale	22	15	0	0	0	0
Do. Brown	21	5	0	0	0	0
Cottonseed ref.	16	10	0	17	10	0
Oleine	17	0	0	19	0	0
Lubricating U.S.	0	5	3	0	7	6
Do. Black	0	5	0	0	6	6
TAR—Stockholm barrel	1	6	6	0	0	0
Archangel	1	0	0	0	0	0
Turpentine	1	14	0	0	0	0

RECENT PATENTS:

ACCEPTED SPECIFICATIONS.

Open to Opposition until June 19.

[1898.] 1,105, West, Apparatus for Cutting Lines, Circles, and other Designs on Glass. 6,207, Csorba, Adjustable Trestle for Scaffolding. 8,800, Fletcher & Cutler, Safety Acetylene Hand Lamps. 8,832, O'Keenan, Electricity Meters. 9,810, McCulloch, Pumps. 10,440, Davis, Means for Supporting and Connecting Arc Lamps and other Electrical Apparatus. 11,357, Baumgartner, Devices for Draining, Separating, and Storing Rain-water shed from Roofs. 11,367, Shackleton & Ross; 12,469, Levetus; 13,029, Jackson; and 13,070, Forbes, Apparatus for Generating Acetylene Gas. 12,012, Falk, Acetylene Gas Lamp or Lantern. 12,016, Sprague, Electrical Control for Elevators. 12,038, Cardiff, Damp-resisting Washable Sanitary Water Composition or Paint. 12,309, Keene, Air Inlet Valve for Sewers, House Drains, &c. 12,489, Wilders, Sludge or Sewage Tanks. 12,722, Mam & Kinnaird, Kitchen Ranges, Stoves, &c. 13,041, Cowey, Self-closing Taps. 13,099, Sutton, Pipes, Pipe-joints, and cognate Apparatus. 13,163, Parkinson, Flush-starting Devices. 13,257, Ellis & Street, Ventilators. 13,311, Prentice, Gauge or Device for Measuring the Rate of Flow of Water. 13,323, Griffiths, Building Brick. 13,435, Farnell, Windows, Casements, &c. 17,316, Challender, Silent Flushing Apparatus. 17,830, Kuhnt & Deissler, Burners for Incandescence Oil Lamps. 18,299, Ingram, Door Fastening. 22,344, Délavau & Brérat, and [1899] 4,231, John Jon, & Wunderlich, Electrical Arc Lamps. 26,779, Myers & Driggs, Windows. 25,180, Drake, Arithmetical Calculators. [1899] 417, Nielsen, Preservative Paint or Coating Material for Pasteboard Roofing Material, &c. 580, Wilson, Telephone Station Apparatus. 1,634, Shaffer, Burners for Acetylene and similar Gas. 3,405, Schmid, Vices. 3,745, Knoch, Manufacturing Corrugated Roofing or Non-Conducting Plates from Felt, Canvas, and similar Fabrics. 3,754, Simon, Berry, & Rayner, Electrical Wall-plugs. 3,769, Petréano, Incandescent Oil or Spirit Lamps. 4,412, Fleming, Window-sashes. 4,607, O'Hara, Dredging Apparatus. 4,754, Cheetham, Hearth Tidies. 5,141, Bigwood & Hancher, Footway or Causeway Channels. 5,255, Hall, Electrical Switches. 5,291, Kraft, Fireproof Liner for Chimneys. 5,531, Keller, Pneumatic Tools.

ABSTRACTS OF PATENTED INVENTIONS.

30,065.—HOLDERS AND SWITCHES FOR INCANDESCENT LAMPS: *J. M. Huisman & H. C. Gover.*—The plunger, carriers, &c., are carried in the insulating body of the holder, which is made in two parts; screws fasten the supply wires to the carrier and a frame, the latter whereof has a spindle with a handle and an arm to make contact with a tongue that extends from one of the plunger carriers; the side of the arm nearer the tongue is covered with insulating material, and a square cam upon the spindle engages a retaining-spring on the frame.

30,077.—BRUSHES FOR CLEANING CHIMNEYS AND FLUES: *W. Francis*—The bristles are mounted on strips or wires of steel which are twisted between two pairs of wires, strips of leather being interposed on each side; at each end of the brush is a screw-threaded piece, one piece for the handle and the other for an anti-friction wheel.

30,122.—FASTENINGS FOR SASH LIFTS AND SLIDING DOORS AND GATES: *G. R. Hill.*—For sashes, a spring-catch in the frame engages a rack upon the upper sash, thereby locking the sash until the catch is disengaged by means of a lever whose handle projects into the room, when the sash is closed the catch wipes past the rack, and a train winds up a spring, to the middle part of which is attached a bevel-wheel that turns freely upon a spindle, at the disengagement of catch the spring uncoils and so moves the sash into the opened position.

30,144.—CEILINGS, FLOORS, BEAMS, AND GIRDERS: *F. Hennebique.*—Concrete slabs are fashioned with iron ribs for forming the flooring and ceiling of a system of concrete flooring; the ribs of the slabs are turned up, that they may hold planks in place by means of cramps or boards, and the spaces are filled with cement to form girders with rods embedded in them; when the cement becomes set, the planks are taken away, and the spaces between the slabs are filled with cement.

30,145.—INCANDESCENT LAMPS: *Chemische Fabrik von Max Jasper.*—In order to make the mantle durable enough to resist vibrations it is impregnated with a solution of an alcoholic and an ether organic compound of silicon, which, on being burned by the flame, forms silicon dioxide upon the mantle; a suitable solution is made of 85 per cent. of amyl alcohol and 15 per cent. of silicic amyl ether.

30,150.—PLANING SEGMENTAL BLOCKS OF STONE: *J. Mann.*—For blocks used in constructing arches, sets of guides, whereof each pair has the shape of concentrical arcs of circles, are provided, the table having correspondingly-curved guides, and a rack which drives it from the worm-shaft, and the tools being carried upon the cross-head. In another form of the contrivance, one pair of guides is made straight, for doing straight work. The radius of the curved work depends upon its distance from the centre and upon the guides that are used, each pair of guides having a separate table.

30,207.—WATER-WASTE PREVENTERS: *V. Francois.*—There is a constant communication between the supply pipe and the closed tank; a ball-valve, whose density is less than that of water, closes the outlet. The dislodgement of the ball, which thereupon rises and floats, is effected by the operation of a disc valve, whose stem rises and strikes the ball when the pull lever is operated. For open-topped tanks the ball is put inside a cage that hangs from the operating lever. For ball-cocks the ball is connected to the end of a pivotted lever, which passes, with a little play, between pins which project from a collar mounted upon the lever of the float.

30,214.—ARTIFICIAL STONE: *G. Vögerl.*—The inventor produces an artificial stone for general building purposes, baths, roofing-tiles, &c., by mixing hydraulic cement, sand, and whole pig's bristles with water, and then moulding the mass into shapes; he also strengthens the stone with wire-netting.

30,241.—EARTHENWARE AND OTHER PIPE JOINTS: *R. Ewing.*—The joint is made by forming an eccentric shoulder upon the inner abutting end, and along the socket's side wall; when the pipe is laid, the shoulder becomes narrower at the socket's upper side; when the joint has been made by running in liquid cement, the flanges are fitted to the spigot end of the pipe, and the abutting edges are packed with clay; the socket walls between the flanges, into which the cement is poured, are circumferentially scored, and a recess is provided for the roll of clay or other plastic material.

30,285.—LOUVRE AND BAFFLE-PLATE APPARATUS: *J. Cousland.*—An angled baffle-plate whose edges are slightly curved outwards, is fixed opposite each opening within the outer casing, in the openings between the baffle-plates are fixed vertical deflecting plates that extend upwards from the shaft to the top of the ventilator and thereby prevent the air currents from striking one another, at the same time directing them to pass through the outlets; the device is described as being also applicable to invisible roof ventilators, and to louvre and other ventilators.

30,295.—ELECTRICAL LIFT AND CRANE LOCKING APPARATUS: *C. E. B. Holt.*—The inventor's object is to lock the lifts or cranes until the motor has attained its full speed; he locks the starting-lever by an L-shaped catch, which is so connected by a wire to the starting-switch that the full current is turned on, and the motor attains its full speed, before the catch liberates the lever.

30,327.—COVERINGS FOR WALLS AND CEILINGS: *H. Buyten.*—In order to produce coverings in imitation of wood with a slightly raised grain, sheets of paper pulp or other plastic material are passed between embossing rollers, or are pressed in engraved moulds, before or after either of which operations colouring matter in imitation of wood may be applied to the surface.

30,344.—FIREPROOF FLOORING: *F. H. Willis.*—That temporary centreing for concrete floors may be dispensed with, hard concrete blocks are placed upon, and cover the underside of, the bottom flanges of the joists, and thus is provided a support for the wet concrete which is then poured in.

30,416.—TELEMETERS: *J. J. Garrard.*—Between the two parts of a folding frame the inventor adjusts the sighting wires, or a transparent scale marked with crosslines, the wires being scaled to show directly, when held at a given distance from the eye, the distance of objects whose dimensions are known; the scales are made interchangeable for different objects, and the wires can be set vertically or horizontally; the instrument may be mounted upon a stick, &c.

30,477.—MOULDING DRAIN-TRAPS: *T. S. Green & S. Wragg.*—Half-moulds are forced together about a core whose vertical portion is fixed to the table, whilst its curved arm is built up of a number of curved segments, whose inner ends are kept in place by a ring carried by a forked lever, and dove-tailed projections at the outer ends interlock with recesses in an internal ring; one of the segments has parallel sides that facilitate the detachment of the trap when it has been moulded, and the two halves of the mould have spring stop-plates arranged to yield upon undue pressure and thus to allow the escape of surplus clay.

30,535.—CIRCULAR LEVELS: *W. Taylor.*—A closely fitting case which has an outwardly bevelled outer edge presses the glass against the inwardly turned lip of the outer case, the joint is made tight with a packing of caoutchouc or similar material, and a plug is used to close the hole through which the liquid is poured.

30,799.—STONE-SAWING: *E. Stead & E. Rhodes.*—The saw frame, which is carried by links from the saddles, bears sideways against anti-friction rollers upon the saddles, the frame being reciprocated by means of a crank and connecting rod, the saddles slide upon the frame, hanging by chains which pass many times around drums and pulleys, and are secured to the bottoms of the saddles; worm-gearing, ratchet gear, a slotted lever, and a cam on the main shaft drive the drums, and fast and loose pulleys are employed for quick feeding or return.

30,809.—COMBINED RULE AND SET-SQUARE: *H. S. Philippe.*—To one leg of an ordinary foot-rule is hinged a folding piece, to be attached to the other leg at any one of the notches graduated in that leg. The two legs may thus be set at various angles, and the rule also may be made to carry a double slide marked with special scales, a spirit-level, a compass, and a sundial.

30,831.—INCANDESCENT GAS LAMPS: *J. Moeller.*—For Bunsen lamps the supply pipe has a vertical section in the shape of a hyperbola; the burner has an outer casing and

an inner perforated metal screen, at the top of which is a button, made of conducting material, carrying a serrated disc, whose diameter is rather less than that of the mouth of the outer case.

20,832.—SUPPORTS FOR ELECTRICAL LAMPS: *J. Brockie.*—To the post, or similar main support, is fitted a socket whose arms carry the cylinder wherein is an insulated bolt from which the arc lamp is suspended; the globe is attached to a ring that slides around the cylinder in such a manner that it may be lifted and held up by a hook when necessary, at other times the globe rests upon a cup (upon the socket) that holds the terminals to which the lamp is connected.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

April 13.—By WALFORD & WILSHIN.

Penge.—17, Queen Adelaide-rd., u.t. 50 yrs., g.r. 7*l.*, e.r. 55*l.*	£450
Anerley.—77, Croydon-rd., u.t. 74 yrs., g.r. 16*l.* 10s., e.r. 100*l.*	800

By Messrs. WOODS.

Ball's Pond.—1 to 4, St. Paul's Mansions, f.r. 195*l.*	3,420

By NEWBON, EDWARDS, & SHEPHARD.

St. John's Wood.—17 to 23 (odd), Bolton-rd., u.t. 59 yrs., g.r. 32*l.*	1,560
Crouch End.—49, Park-rd., u.t. 82 yrs., g.r. 12*l.* 12s., r. 70*l.*	1,000
Kentish Town.—23 to 31 (odd), York Rise, f., r. 210*l.*	2,925
Highbury.—26, Hamilton-rd., u.t. 48 yrs., g.r. 7*l.* 10s., r. 45*l.*	455
Holloway.—Ingleby-rd., &c., i.g.r. 38*l.*, u.t. 50½ yrs., g.r. 8*l.*	610
Stoke Newington.—7 and 8, Lordship-grove, u.t. 63½ yrs., g.r. 7*l.*, r. 57*l.*	460
Dalston.—128 and 130, Pownall-rd., u.t. 46 yrs., g.r. 7*l.*, r. 67*l.* 4s.	620

By STIMSON & SONS.

Fulham.—23, 25, 31, and 33, Epirus-rd., f., r. 162*l.*	1,855
Battersea.—25 to 28, Victoria-rd., u.t. 78 yrs., g.r. 20*l.*, r. 180*l.*	2,040
54, 68, and 70, Grant-rd., u.t. 65 yrs., g.r. 18*l.* 18s.	645
Peckham.—1 to 7 (odd), Lidgate-rd., u.t. 65 yrs., g.r. 20*l.*	920
Notting Hill.—122, Elgin-cres., area 8,000 ft., f.	890
Putney.—10, Disraeli-rd., u.t. 69½ yrs., g.r. 8*l.* 8s., e.r. 45*l.*	425
Walworth.—9 and 11, Townley-st., f.	265
Islington.—1 and 2, Baron-st., u.t. 47 yrs., g.r. 30*l.*	125

By GENDLE & CO. (at Croydon).

Croydon.—15, Mayday-rd., u.t. 78½ yrs., g.r. 5*l.* 10s., r. 30*l.*	300
Lismore-rd., a freehold building site	555

April 14.—By Messrs. SPELMAN (at Norwich).

Norwich.—6, Surrey-st., and house adjoining, f., r. 84*l.*	1,810

By G. B. SMALLPEICE (at Knaphill).

Knaphill, Surrey.—Guildford-rd., freehold shop and premises, r. 20*l.*	305
Folk's Orchard, a freehold cottage, garden, and orchard, 0 a. 2 r. 37 p., r. 12*l.*	140

By G. HERBERT BURNS.

Twickenham.—St. George's-rd., Whitelands, Rosedale, Beechland, and Glenbrook, f., r. 225*l.*, (in lots)	3,090
Highgate.—45, Woodsome-rd., u.t. 63 yrs., g.r. 7*l.*, r. 40*l.*	430

By H. CHAPMAN & CO.

Fulham.—71, New King's-rd., u.t. 90 yrs., g.r. 9*l.*, r. 60*l.*	760
Blackheath.—7, Park Villas, u.t. 78 yrs., g.r. 9*l.* 8s., r. 55*l.*	565
Barnes.—119 to 127 (odd), White Hart-lane, u.t. 70 yrs., g.r. 25*l.*, r. 164*l.*	1,300

By DRIVERS (Holloway).

Finsbury Park.—1, Victoria-ter., u.t. 76 yrs., g.r. 7*l.*, r. 38*l.*	375
Fulham.—46, Chesilton-rd., u.t. 81 yrs., g.r. 8*l.*, r. 40*l.*	390

By P. & G. GEEN.

Walthamstow.—Rosebank-ter., f.g.r. 10*l.*, reversion in 98 yrs.	270
Fulham.—35 and 37, Orbain-rd., u.t. 86 yrs., g.r. 8*l.* 8s.	320

By HAMILTON & MIALL.

Herne Hill.—29 to 39 (odd), Milton-rd., f., r. 232*l.*	3,660
Stoke Newington.—8, Park-lane, u.t. 61 yrs., g.r. 9*l.*, r. 40*l.*	455
Dalston.—233, Queen's-rd., u.t. 14 yrs., g.r. nil, r. 36*l.*	225
Cambridge Heath.—2 and 4, St. Jude's-st., u.t. 25 yrs., g.r. 32*l.*	180

By R. PRICE & SON.

Tooting.—19, Streathbourne-rd., u.t. 91 yrs., g.r. 8*l.* 10s., e.r. 52*l.* 10s.	610
Bermondsey.—27 and 29, Anchor-st., u.t. 39 yrs., g.r. 8*l.* 10s.	430

By E. & S. SMITH.

Chiswick.—23, Sutton Court-rd., u.t. 79 yrs., g.r. 30*l.*, r. 120*l.*	1,200
Islington.—4, Milner-st., u.t. 28½ yrs., g.r. 9*l.*, r. 50*l.*	375
16, Brooksby-st., u.t. 9¾ yrs., g.r. 5*l.* 5s., r. 42*l.*	125
9a, Gordon-st., u.t. 27 yrs., g.r. nil	165
Hackney.—228, Richmond-rd., u.t. 46 yrs., g.r. 12*l.*, r. 45*l.*	350
Poplar.—36, Alton-st., u.t. 77 yrs., g.r. 3*l.* 10s.	200
South Tottenham.—6 and 8, Osman-rd., u.t. 77 yrs., g.r. 7*l.*	220

By MARK HUBBARD.

Kentish Town.—23 and 25, Leighton-rd., f.	1,755
Leighton-rd., i.g.r. 129*l.* 10s., u.t. 24 yrs., g.r. 31*l.* 10s.	1,225
Leverton-st., i.g.r. 15*l.* 15s., u.t. 50 yrs., g.r. 3*l.*	235
31 to 45 (odd), Leverton-st., u.t. 50 yrs., g.r. 10*l.*, r. 278*l.*	3,320
Falkland-rd., i.g.r. 10*l.* 10s., u.t. 50 yrs., g.r. 2*l.*	145
4 to 14 (even), Falkland-rd., u.t. 50 yrs., g.r. 6*l.*, r. 206*l.*	2,590

April 15.—By Messrs. SPELMAN (at Norwich).

Wramplingham, Norfolk.—A freehold and copyhold farm, 46 a. 3 r. 16 p.	£1,000
Roydon, Norfolk.—A residence, with mill house and cottage, f.	415
Four freehold cottages	190
Limpenhoe, Norfolk.—The Low Farm, 43 a. 2 r. 5 p., f. and c.	685
Reedham, Norfolk.—A freehold residence and cottage, and 1 a. 1 r. 0 p.	400

April 17.—By MULLETT, BOOKER & CO.

Notting Hill.—38, Ladbroke-rd., f.	3,100
Hyde Pk.—47, Norfolk-sq., u.t. 59 yrs., g.r. 30*l.*	620

By NOTLEY & CO.

Whitechapel-rd.—Nos. 339 and 341, area 3,960 ft., f., r. 155*l.*	4,100
Bethnal Green.—192, Cambridge-rd., f., r. 32*l.*	700
Spitalfields.—18, Fournia-st., area 1,157 ft., f., r. 50*l.*	1,420
Mile End.—28 and 30, Cephas-st., u.t. 31 yrs., g.r. 6*l.* 10s., r. 60*l.*	600

By ST. QUINTON & SON.

City of London.—33, Nicholas-lane, area 670 ft., f.	14,550

By WESTMORE & YOUNG.

Norwood.—47, Cintra Pk., u.t. 59 yrs., g.r. 6*l.* 15s., e.r. 45*l.*	340

By ELLIOTT, SON, & BOYTON.

Regent-st.—Nos. 191 and 193, u.t. 22¼ yrs., g.r. 86*l.* 10s., r. 910*l.*	12,400
215, Regent-st., u.t. 21½ yrs., g.r., &c., 37*l.* 15s., r. 500*l.*	6,500
Croydon.—8, 9, 10, and 11, Elgin-rd., f., r. 134*l.*	1,720
Greenwich.—5, The Circus, f., r. 40*l.*	545
Woolwich.—New-rd., "The Gun Tavern," i.g.r. 100*l.*, u.t. 28½ yrs., g.r. 22*l.*	1,220
New Cross.—26 and 28, Florence-rd., u.t. 47½ yrs., g.r. 6*l.* 8s., r. 52*l.*	630

By MARK HUBBARD.

Camden Town.—47, Ferdinand-st., f., e.r. 60*l.*	820
Kentish Town.—Leverton-st., i.g.r. 105*l.*, u.t. 43 yrs., g.r. 9*l.*	1,640
Leverton-st., i.g.r. 15*l.* 15s., u.t. 50 yrs., g.r. 1*l.*	250
Leverton-pl., i.g.r. 10*l.* 10s., u.t. 43 yrs., g.r. 1*l.*	170
3 and 3, Leverton-pl., u.t. 43 yrs., g.r. 2*l.*, r. 80*l.*	780
16 to 24 (even), Falkland-rd., u.t. 50 yrs., g.r. 5*l.*, r. 186*l.*	2,540
3 to 13 (odd), Falkland-rd., u.t. 50 yrs., g.r. 6*l.*, r. 204*l.*	2,575
1, 3, 5, and 7, Falkland-pl., u.t. 50 yrs., g.r. 2*l.*	1,010
9 to 19 (odd), Falkland-pl., u.t. 43 yrs., g.r. 6*l.*	1,350
302, Kentish Town-rd., u.t. 43 yrs., g.r. 5*l.* r. 65*l.*	1,000
Lewis-st., i.g.r. 18*l.*, u.t. 40 yrs., g.r. 10s.	300
64 and 66, Highgate-rd., u.t. 43 yrs., g.r. 12*l.*, r. 60*l.*	760
74, Highgate-rd., u.t. 50 yrs., g.r. 4*l.*, r. 60*l.*	860
Highgate-rd., i.g.r. 10*l.*, u.t. 43 yrs., g.r. 3*l.*	120
Hackney.—Sandringham-rd., the Mitford Tavern, i.g.r. 100*l.*, u.t. 67 yrs., g.r. 30*l.*	1,400

By ELLIOTT, ELLIS, & CO. (at Plymouth).

Plymouth.—Tavistock-rd., &c., a corner plot of land, area 1,307 ft., f.	1,150
Tavistock-rd., four plots of land, area 6,026 ft., f.	3,650
Tavistock-rd., four plots of land, area 7,926 ft., f.	5,600
Tavistock-rd., &c., a corner plot of land, area 2,834 ft., f.	2,700
Tavistock-pl., &c., a corner plot of land, area 1,342 ft., f.	750

April 18.—By BEST & SONS.

New Southgate.—High-rd., the Northern Star p.-h., f.g.r. 105*l.*, reversion in 39 yrs.	3,950

By D. B. BRYETT.

Chelsea.—2, Holbein-mews, u.t. 86½ yrs., g.r. 5*l.*, e.r. 120*l.*	1,875

By CHINNOCK, GALSWORTHY, & CO.

Kensington.—17, Kensington Palace-gdns., area 25,000 ft., u.t. 43 yrs., g.r. 80*l.*	8,300
Hyde Pk.—10, Ennismore-gdns. and 28, Ennismore-gdns. mews, u.t. 49 yrs., g.r. 195*l.*	5,000
Old Charlton, Kent.—1 to 10, Charlton Park-ter., r. 570*l.*, and plot of land, area 3 r. 27 p., f.	7,800
Mitcham Common.—Tamworth Park-av., Elmhurst, r. 75*l.*, also a plot of building land, f.	1,800
Tamworth Park-av., Tamworth House, f., r. 95*l.*	1,525

By DEBENHAM, TEWSON, & CO.

Regent-street.—27, 28, and 29, King-st., area 2,700 ft., f., r. 450*l.*	11,250
Muswell Hill.—Colney Hatch-lane, Essex Lodge and 1 a. 2 r. 34 p., f.	1,825
Clerkenwell.—9 and 10, Jerusalem-court, area 1,085 ft., f.	355
Blackfriars.—27 to 30, Nelson-sq., u.t. 6 yrs., g.r. 24*l.*, r. 220*l.*	460
Turnham Green.—56, Bath-rd., u.t. 75½ yrs., g.r. 9*l.*, r. 42*l.*	375

By S. FORTESCUE & SONS.

Tottenham.—74 to 80 (even), Northumberland-pk., f., r. 122*l.*	2,060

By F. WARMAN.

Highbury.—94, Highbury New Park, u.t. 50½ yrs., g.r. 15*l.*	990
Fulham.—1 to 11 (odd), Armdale-rd., u.t. 73½ yrs., g.r. 16*l.* 4s.	2,340
2 to 12 (even), and 9, Ricketts-st., u.t. 53 yrs., g.r. 42*l.*	1,610
1 to 4, Roxby-pl., u.t. 53 yrs., g.r. 31*l.*	325
Sydenham Hill.—Panmure-rd., Camden Villa, f., e.r. 40*l.*	710
Stroud Green.—1, Connaught-rd., u.t. 77 yrs., g.r. 8*l.* 10s., e.r. 52*l.*	600

By DAVID BURNETT & CO.

Stamford Hill.—80, Darenth-rd., u.t. 84 yrs., g.r. 7*l.* 10s.	950
Tottenham.—15 to 25 (odd), Victoria-ter., u.t. 98 yrs., g.r. 36*l.*, r. 178*l.*	1,700

April 19.—By J. BOTT & SONS.

Norwood.—66, 66a, 68, and 68a, Hamilton-rd., u.t. 80½ yrs., g.r. 21*l.*	575

By GEORGE BRINSLEY.

Stockwell.—37, Chantry-rd., u.t. 72½ yrs., g.r. 7*l.*, r. 38*l.*	405

By H. DONALDSON & SON.

New Barnet, Herts.—Warwick-rd., Brandon House, f., r. 65*l.*	£1,090

By SALTER, REX, & CO.

Holloway.—9, Annette-rd., u.t. 65 yrs., g.r. 10*l.* 10s., r. 60*l.*	595
Kentish Town.—38 and 39, Ospringe-rd., u.t. 66 yrs., g.r. 5*l.*, r. 98*l.*	1,200

By FOSTER & CRANFIELD.

New Barnet, Herts.—5, Henry-rd, f., r. 30*l.*	400
3 and 4, Camden-villas, f., r. 64*l.*	745
Victoria-rd., Ryhall Lodge, f., r. 28*l.*	380
Victoria-rd., Benhilton, e.r. 35*l.* / Crescent-rd., a plot of building land, f.	685

By E. W. RICHARDSON & SON.

Croydon.—41, The Crescent, u.t. 90 yrs., g.r. 3*l.* 10s., r. 35*l.*	375

By JOSEPH STOWER.

Camberwell.—193, The Grove, f., r. 63*l.*	1,320
Battersea.—63, Park-rd., u.t. 81 yrs., g.r. 3*l.* r. 45*l.*	400
Bexhill-on-Sea.—Upper Station-rd., Maybury, u.t. 89 yrs., g.r. 8*l.* 5s., r. 65*l.*	850
Upper Station-rd., Dovercourt, u.t. 86 yrs., g.r. 7*l.* 19s., r. 65*l.*	830

April 20.—By HUMPHREYS, SKITT, & HUMPHREYS.

New Cross.—5, 9, 11, 17, and 27, Nettleton-rd., u.t. 46 yrs., g.r. 25*l.*, r. 172*l.*	1,700
280, New Cross-rd., u.t. 42¼ yrs., g.r. 8*l.*, r. 45*l.*	460
Catford.—11, Perry-hill, u.t. 72 yrs., g.r. 5*l.*, r. 36*l.*	400

By NOTT & CARTWRIGHT.

Surbiton, Surrey.—5 and 6, St. Andrew's-sq., f., e.r. 130*l.*	1,400
Acton.—1, Essex-rd., with yard, stabling, &c., adjoining, u.t. 69 yrs., g.r. 12*l.*, r. 130*l.* 6s. 6d.	950
Pimlico.—12, Alderney-st., u.t. 30 yrs., g.r. 8*l.*, r. 60*l.*	535

By ERNEST OWERS.

Hampstead.—7, Sherriff-rd., f., r. 62*l.*	1,155

By H. J. BLISS & SONS.

Bethnal Green.—3, 4, 5, and 6, Totty-st., u.t. 51½ yrs., g.r. 12*l.* 12s.	795
19 and 21, Stainsbury-st., u.t. 25 yrs., g.r. 6*l.*	265
Mile End.—151, 153, and 155, Sidney-st., f.	1,030
55, Raven-row, f.	350
Walthamstow.—44 to 52 (even), Brown's-rd., f.	900
39 and 41, Hoe-st., f.	580
Finchley.—1, 2, 3, and 4, Coleridge-rd., f.	1,000
12, 13, and 14, Brownlow-rd., f., r. 78*l.*	750

By NEWBON, EDWARDS, & SHEPHARD.

Hornsey.—28 and 30, Gladwell-rd., u.t. 89 yrs., g.r. 12*l.*, r. 72*l.*	745
36, Gladwell-rd., u.t. 86 yrs., g.r. 6*l.*, r. 36*l.*	360
10, Gisburn-rd., u.t. 95 yrs., g.r. 7*l.*, e.r. 40*l.*	400
Dalston.—33, Shrubland-grove, u.t. 42 yrs., g.r. 4*l.* 4s., e.r. 35*l.*	335
8 and 10, Greenwood-rd., u.t. 46 yrs., g.r. 12*l.*, r. 60*l.*	650
50, Richmond-rd., u.t. 41 yrs., g.r. 2*l.* 8s., r. 30*l.*	320
Bethnal Green.—34 to 40 (even) Viaduct-st., u.t. 19 yrs., g.r. 12*l.*	510

By STIMSON & SONS.

Battersea.—45 to 53 (odd), Queen's-rd., u.t. 66 yrs., g.r. 37*l.* 10s., r. 240*l.*	2,700
Norwood.—47 to 55 (odd), Cobden-rd., f.	1,150
Walthamstow.—Lowther-rd., four plots of building land, f.	180
Camberwell.—125 and 127, Flaxman-rd., u.t. 12¼ yrs., g.r. 6*l.* 16s.	165
42 and 44, Bengeworth-rd., u.t. 74 yrs., g.r. 10*l.*	480
Pimlico.—2, Churton-pl., u.t. 31 yrs., g.r. 6*l.* 10s., r. 48*l.*	455
6, Ranelagh-grove, u.t. 24 yrs., g.r. 5*l.*, r. 42*l.*	390

By J. G. PERRY (at Brighton).

Brighton.—12, 13, 16, and 17, Kingsbury-st., f.	1,525
8, 9, and 10, Baker-st., u.t. 55 yrs., g.r. 15*l.*, r. 73*l.* 4s.	955
8, Howard-rd., f.	360
40, Marine-parade, u.t. 14 yrs., g.r. 65*l.*, and 1, New Steine, f., r. 180*l.*	1,115
58, Preston-st., f., r. 71*l.*	1,570
52, Compton-av., f., r. 48*l.*	740
42 to 45, William-st., u.t. 20½ yrs., g.r. 12*l.* 16s.	415

April 21.—By W. A. BALL.

Pall Mall.—22, Crown-ct., f., r. 52*l.* 10s.	1,660
Norwood.—33, Camden Hill-rd., u.t. 52 yrs., g.r. 6*l.*, r. 30*l.*	220

By J. HIBBARD & SONS.

New Barnet, Herts.—Bulver-rd., f., r. 30*l.*	500
Chiswick.—46 to 52 (even), Swanscombe-rd., u.t. 80 yrs., g.r. 18*l.*	855
Old Kent-rd.—11 and 13, Hornshay-st., u.t. 62 yrs., g.r. 12*l.*, r. 60*l.*	570
Stoke Newington.—110, Mildmay-rd., u.t. 52 yrs., g.r. 7*l.*, e.r. 42*l.*	400

By BALL, NORRIS, & HADLEY.

Old Kent-rd.—5 and 6, Albany-rd., u.t. 59½ yrs., g.r. 17*l.*, r. 70*l.*	630
Peckham.—7, Hillsboro, u.t. 82 yrs., g.r. 7*l.*, r. 32*l.*	305

By JONES, LANG, & CO.

Bloomsbury.—7 and 8, Woburn-sq., u.t. 29 yrs., g.r. 56*l.*, r. 225*l.*	1,520
38, Woburn-sq., u.t. 29 yrs., g.r. 28*l.*, r. 105*l.*	800
7, Torrington-sq., u.t. 21 yrs., g.r. 12*l.*, r. 90*l.*	650
Bayswater.—44, Ledbury-rd., u.t. 50 yrs., g.r. 10*l.* 10s., r. 75*l.*	1,200

By THURGOOD & MARTIN.

Petersfield, Hants.—Rams Hill, two enclosures of building land, 5 a. 3 r. 25 p., f.	1,000

By REYNOLDS & EASON.

Hoxton.—Newton-st., the Bethel Baptist Chapel, u.t. 32 yrs., g.r. 4*l.* 4s.	460
Caledonian-rd.—106 and 108, Brewery-rd., u.t. 60 yrs., g.r. 10*l.*	650
Barnsbury.—23, Hollingsworth-st., u.t. 44½ yrs., g.r. 6*l.*, r. 37*l.*	300
Spitalfields.—42, Brushfield-st., f., r. 60*l.*	870

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Municipal Buildings and Library	Plumstead Vestry . ..	100*l.*; 75*l.*; and 50*l.*	July 27

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
*Paving, &c. Works	Beckenham U.D.C. ..	J. A. Angell, Council Offices	May 1
*Structural Steel Work of Tower.....	Morecambe Tower Co. Ltd.	R. T. Gifford Read, 1, Gt. Chapel-st. Westminster	do.
*Victoria Stone Paving	Tottenham U.D.C.....	P. E. Murphy, 712, High-rd. Tottenham	May 2
Surveyor's Materials	Milnrow (Lancs.) D.C.	H. Blackburn, Council Offices, Milnrow	do.
Additions to Factory, Colchester	.....	Goodey & Cressall, Archt. Victoria-chambers, Colchester.....	do.
Street Works	Barton-upon-Irwell R.D.C.	Mr. Hooley, C.E. Union Offices, Patricroft	do.
Artisans' Dwellings, St. Helen's-rd...	Brighton Corp.	F. J. C. May, C.E. Town Hall	do.
Bridge, Cudley	Sudbury R.D.C.	J. Barker, Surv. Cudley, Derby	do.
Sewers, Prospect-road.....	Knaresborough R.D.C.	Mr. Annakin, Surv. 44, Station-parade, Harrogate	do.
Schools, Grove-road, Fenton	Stoke-on-Trent Sch.Bd.	R. Scrivener & Sons, Archt. Hanley	do.
Granite Road Metal.....	Melton Mowbray U.D.C.	E. Jeeves, Surv. Melton Mowbray	May 3
Street Works	Ware U.D.C.	J. Goddard, Surv. Town Hall	do.
Sewers	Mexborough U.D.C. ..	G. F. Carter, Surv. Market Hall	do.
Sewers	Rochdale Corp.	S. S. Platt, C.E. Town Hall	do.
Asphalting, Beaumont Park	Huddersfield Corp. ..	K. F. Campbell, C.E. Town Hall	do.
Paving Works, Ellen-street	Hove T.C.	H. Endacott, Town Hall..	do.
Alterations to Schools near Belper ..	Heagh Sch. Bd.	B. Glossop, Bull Bridge, Arubergate	do.
Stoneware Pipes, &c.	Rochester Corp.	W. Banks, C.E. Guildhall, Rochester	do.
Sewering Bcarshaw Clough	Middleton Corp.....	W. Welburn, Boro Surv. Town Hall	do.
Additions to Asylum, Ipswich	Visitors	E. Buckham, Boro Surv. Town Hall..	do.
Main Sewers	Thames Ditton U.D.C.	A. J. Henderson, C.E. Thames Ditton.....	do.
Alterations to House, Roath Market	Cardiff Corp.	W. Harpur, C.E. Town Hall	do.
Additions to Rectory, Sproutley, Hull	.....	Botterill & Co. Archt. 23, Parliament-street, Hull	May 4
Fire Brigade House, Stables, &c. Wakefield-road	Featherstone (Yorks.) U.D.C.	W. A. Palliser, Engr. Town Hall	do.
Entrance Gates, &c. Roundhay Park	Leeds Corp.	City Engr. Leeds	do.
Brick Sewers	Ardrosson (N.B.) Police Commrs.	W. R. Copland, C.E. 146, West Regent-street, Glasgow	do.
Shop and House, Main-street, Letterkenny	.....	Mr. O'Callaghan, C.E. Letterkenny	do.
Additions to Highfield, Batley	.....	W. Crawshaw, Archt. Branch-avenue, Batley..	do.
Offices, &c. South-street.....	Bridport Gas Co.	Manager, Gas Offices, Bridport	do.
Flint Road Metal	Uckfield U.D.C.	C. Dawson, Uckfield....	do.
Granolithic Paving	do.	do.	do.
*New Chapel at Asylum	Glamorgan County Asylums	Giles, Gough, & Trollope, 28, Craven-st. W.C.....	do.
Business Premises, Brotton...	Loftus Co-op. Soc.	A. F. Newsome, Archt. Albert-rd. Middlesbrough	May 5
Additions to House, Hayton	W. Wilson	A. W. Johnston, Archt. 81, Castle-st. Carlisle	do.
Granite Kerbing, Nightingale-lane .	Wanstead U.D.C.	W. Blewitt, Council's Offices, Wanstead	do.
Additions to White Horse Inn, Elgin	.....	C. C. Doig, Archt. Elgin..	do.
Villa, Linthorpe	Mr. Brown	A. Newsome, Archt. Albert-road, Middlesbrough ..	do.
Villas, Phillipsville Estate, Linthorpe	T. Phillips	do	do.
Stone (3,000 tons)	Thirsk (Yorks.) R.D.C.	C. McC. Swarbreck, Thirsk	May
Asphalt Works	Minehead U.D.C.	J. Cribb, Surv. Glenmore-rd. Minehead.....	do.
Schools, Haley Hill	Halifax Sch. Bd.....	W. C. Williams, Archt 22, Southgate, Halifax.....	do.
Concrete Wall, &c. Crickhowell	Brecon C.C.	H. E. Thomas, County Hall, Brecon.....	do.
*Painting, Whitewashing, &c.	St. Marylebone Gdns.	F. W. Lee, Workhouse, Marylebone-rd. W.....	May 8
Rebuilding Engineers' Arms Inn, Bedminster	.....	H. Williams, Archt. 24, Clare-st. Bristol	do.
Alterations to School, Govilon, Abergavenny	.....	E. Edwards, Cwm, Govilon, Abergavenny	do.
Electric Lighting Buildings.....	Darlington Corp.	Boro. Surv. Town Hall ..	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
*Yellow Deal and Jarrah Wood Paving Blocks	St. Marylebone Vestry	J. P. Waddington, Court House, Marylebone-lane	May 8
*Seventy-six Workmen's Dwellings....	Barnes U.D.C.	G. B. Tomes, Officer, High-st. Mortlake	May 9
*Heating and Lighting Council Offices	Hemel Hempsted Corp.....	W. B. Locke, Town Hall..	do.
*Alterations to Municipal Buildings ..	do.	do.	do.
Rebuilding Business Premises, Halesworth	H. S. K. Stanford	Mr. Stanford, Halesworth	do.
*Alterations and Additions to School..	Westminster Vestry	Beazley & Burrows, 17, Victoria-st. S.W.....	do.
*Road Making Works	Willesden D.C.	O. C. Robson, Offices, Dyne-rd. Kilburn	do.
*Steam Road Roller	Twickenham U.D.C...	F. W. Pearce, Town Hall, Twickenham.....	May 10
*Street Improvement Works.....	do.	do.	do.
*Water Tank, Steel, and Builder's Work in connexion with a Water Tower	West Ham Union	Clerk Offices, Union-road, Leytonstone	do.
*Pipe Sewers, Manholes, &c.	Plumstead Vestry	W. C. Gow, Vestry Hall, Maxey-rd. Plumstead ..	do.
*Granite Edge and Flat Kerb and Granite Pitchers.....	Brighton Corp.	F. J. C. May, Town Hall	May 12
Additions to Schools, Illogan, Cornwall		S. Hill, Archt. Green-lane, Redruth	do.
*Extension of Post Office, Manchester	Commrs. H.M Works	Office, Storey's Gate, S.W.	do.
Drainage Works, Minster, Derby ...	Bakewell R.D.C.	Sterling & Swann, Engrs. Town Hall, Chapel-en-le-Frith	May 13
Granite Road Metal	Saffron Walden Corp.	A. H. Forbes, Boro. Surv.	May 15
*New Hall, &c.....	Y. W. C. A. Finchley Branch.....	W. Hollis, Estate Office, opposite Church End Station, Finchley	do.
*Electric Light Station and Chimney Shaft	Bexhill U.D.C.	A. H. Preece, 13, Queen Anne's Gate, S.W.	do.
*Two Libraries, Lewisham and Forest Hill	Lewisham Vestry	J. Andrews, 13, Basinghall-st. E.C.	May 16
*Schools	Edmonton S.B.	H. W. Dobb, 110, London Wall, E.C.	do.
*Filter Bed in Kew Gardens	Commrs. H.M. Works	Clerk of Works, Kew Palace, S.W.	do.
Pipes and Gullies	Leeds Corp.	City Engineer, Municipal Buildings	do.
*Sewerage Works, Kirby Muxloe.....	Blaby R.D.C.	J. B. Everard, 6, Millstone-lane, Leicester	May 22
*Infirmary Wards, &c.	Tendring Union	F. Whitmore, Chelmsford	May 24
*Electric Light Buildings	Darlington Corp. ..	Boro. Surv. Town Hall ..	May 30
*Iron or Steel Winches.....	James Syn. Ltd.....	Offices, 18, Billiter-st, E.C.	do.
*Erection of Asylum..	Brecon and Radnor Asylum Com	Giles, Gougl. & Trollope, 28 Craven-st. W.C. . ..	do.
Business Premises, Hereford	King & Sons.....	W. W. Robinson, Archt. 16, King-st. Hereford	No date
Alterations to Premises, Widemarsh-st. Hereford	P. Morris & Son	do.	do.
Factory, Norwich	A. J. Caley & Son, Ld.	E. Boardman & Son, Archt. Queen-st. Norwich	do.
Improvements to Schools, Forster-st.	Nottingham Sch. Bd.	R. C. and E. R. Sutton, Archt. Angel-row, Nottingham	do.
Alterations to Inn, Crumlin-road, Belfast...	J. M'Kenna	W. J. Moore, Archt. Ann-st. Belfast	do.
Alterations to Business Premises, Doncaster	Farmers & Cleveland Dairies Co. Ltd.....	Atbron & Beck, Archt. Dolphin-chambers, Doncaster	do.
Additions to White Hart Hotel, Ashbourne.....	S. Evershed	Garlick & Flint Archt. Buxton	do.
Alterations to Schools.....	Arnold (Notts.) Sch. Bd.	J. R. Swift, Archt. Frout-st. Arnold	do
Vicarage and Stables, Alveley, Salop..	.....	A. E. L. Oswell, Archt. Shrewsbury	do
Villa, Maldon-rd. Colchester	.....	J. W. Start, Archt. Colchester	do.
Bank Premises, Fermoy, Cork.....	Prov. Bank of Ireland Ltd.	Kaye & Co. Archts, 83, Dawson-st. Dublin	do.
Alterations to Premises, Dobbin-st Armagh	..	J. F. Gilchrist, C.E. Armagh	do.
Eight Houses, Chapel Close, Kendal..	R. F. Chorley	J. Stalker, Archt. 57, Highgate, Kendal	do.
House, Common Side, Hanging Heaton, Yorks.	.....	W. Crawshaw, Archt. Branch-av. Batley	do
Alterations to Workhouse, Barwick-in-Elmet..	....	P. Robinson, Archt. 72, Albion-st. Leeds	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
*Surveyor	Lee B. of W.....	300*l.* per annum	May 1
*Two Assistant Surveyors	Staffs C.C.....	175*l.* per annum each	May 9
*Clerk of Works	Reigate T.C.....	3*l.* 3s. per week	do.
*Building Inspector	Wood Green U.D.C. ..	52s. 6d. week	do
*Assistant Surveyor	Whitechapel B. of W.	3*l.* per week	May 10

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xixb. Public Appointments, pp. xix. & xixb.*

Aldershot.—Cambridge-rd, Hertford Lodge and a plot of land, f., r. 38*l.* £510
Cambridge-rd., Dean House, f., e.r. 35*l.* 490

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent yd. for yard, &c.

TO CORRESPONDENTS.

J. S. M.—A. E. (Amounts should have been stated.)

NOTE.—The responsibility of signed articles, letters, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ACTON.—For the erection of a girls' school in Creffield-road, Acton, for the Managers of Aske's Haberdashers' Schools. Mr. Henry Stock, architect. Quantities by Messrs. Widnell & Trollope:—

Balaam Bros.....	£23,555	Bowers & Co.....	£21,300
Ferris Bros.	23,506	H. Flint	21,184
Akers & Co.	23,415	Godson & Sons	21,152
A. Porter.....	22,777	Gough & Co.	20,824
J. Marsland	22,575	Willmott & Sons ..	20,798
Willcock & Co.	22,354	T. J. Messom	20,577
W. Robinson	21,650	Hockley & Son	20,574
B. E. Nightingale..	21,585	Chessum & Sons ..	20,036
Turtle & Appleton	21,530	Patman & Fotheringham*	19,911
J. Christie	21,400		

ABERDARE.—For the erection of seventeen houses, Cwmaman, for the Building Club. Mr. Llewellin Smith, architect, 20, Commercial-street, Aberdare:—
Morgan & Sons....£182 10 | Willis, Ystrad* £162 10

ARDROSSAN, N.B.—For additions to the Academy, for the School Board. Mr. J. Armour, jun., architect, Irvine. Quantities by Messrs. John Dansken & Purdie, Glasgow:—

Digging, Masonry, and Bricklaying.—John Inglis, Ardrossan*.....	£1,071	14	3
Carpentering and Joinery.—Wm. Gray, Kilwinning*	591	2	11
Plumbing and Gasfitting.—John Lambert, Ardrossan*	199	6	5
Slating.—Robt. Boyd, Saltcoats* ..	180	9	7
Plastering and Cementing.—*John Ramage, Saltcoats*.....	158	6	4
	£2,200	19	6

BEDDGELERT.—For the erection of farmhouse at Llyndy, for Mr. T. E. Roberts. Mr. Thomas Roberts, architect, Portmadoc:—
Evan E. Jones..... £725 | Jones, Roberts, & Jones, Pwllheli*.... £690
[Architect's estimate, £740]

BOURNEMOUTH.—For painting the Promenade Pier. Mr. F. W. Lacey, Borough Engineer and Surveyor :—

	Genuine White Lead Paint.	Calley's Torbay Oxide Paint.	Ferrodor Paint.
	£ s.	£ s.	£ s.
Miller & Sons	348 10	386 0	389 0
F. T. Cutler	342 0	360 10	378 0
Shears & Sons	350 0	365 0	365 0
Jenkins & Sons*	329 0	346 0	363 0
Jones & Son		(informal).	

[All of Bournemouth].

BRYN (Wales).—For the erection of school buildings, for the Margam School Board. Mr. F. B. Smith, architect, Port Talbot :—

Davies & Sons	£3,625	C. & F. Gaen	£3,640
Evan Thomas	3,649	Jenkins, Port Talbot*	3,273

CARDIFF.—For the erection of school, Virgil-street, Grangetown, manual instruction centre and caretaker's house, &c., for the School Board. Messrs. R. and S. Williams, architects, Borough Chambers, Wharton-street, Cardiff. Quantities by architects :—

Shepton & Son	£26,720 0 0
D. Thomas & Co.	26,520 0 0
Price Bros.	26,135 0 0
Evans Bros.	24,310 13 7
W. H. Ingleson	24,191 1 0
W. Thomas & Co.	24,030 0 0
James Allan	23,906 6 6
Knox & Wells	23,750 0 0
W. Symonds & Co.	23,500 0 0
Lattey & Co.	23,348 0 0
Chubb & Co.	23,100 0 0
D. Davies	22,875 0 0
Turner & Sons	22,516 0 0
C. C. Dunn*	22,200 0 0

[All of Cardiff.]

CARDIFF.—For the erection of wall, &c., for the Corporation. Mr. W. Harpur, C.E., Town Hall, Cardiff :—

Knox & Wells	£646 13 0	Richard Dinham	£593 1 6
J. Allan	639 4 3	G. Griffiths	580 0 0
Powell & Mansfield	637 0 0	Handford & Ellsworthy	575 0 0
F. G. Robbins	613 1 3	Edgar Brown	570 10 3
Henry Gibbon	610 9 0	Price Bros.	568 19 5
Rees & Thomas	610 0 0	Thomas & Co.	562 12 7
W. H. Ingleson	609 18 0	J. Thomas*	537 12 5

[All of Cardiff.]

CARLISLE.—For building the foundations of St. Aidan's Church, Warwick-road, for the Committee for Church Extension in the City of Carlisle. Mr. C. J. Ferguson, architect, 50, English-street, Carlisle. Quantities by the architect :—

Wm. Baty, Carlisle* £759 19

COVENTRY.—For pulling down and rebuilding the "General Wolfe" public-house, Foleshill, near Coventry, for Messrs. Phipps & Co., Northampton. Mr. T. F. Tickner, architect, Coventry :—

C. H. Barber, Coventry* £4,449

COVENTRY. — For the erection of residence and stabling at Kearsley, near Coventry, for Mr. C. Adcock, Coventry. Mr. F. Foster, architect, Leamington and Coventry :—

C. H. Barber, Coventry* £4,750

DUDLEY.—For alterations and extensions to premises, Stone-street, Dudley, for Mr. J. Baker. Mr. A. Ramsell, architect, 7, Priory-street, Dudley :—

Dorse & Co.	£558	Holland & Son, Dudley*	£550

FRINTON-ON-SEA. — For laying a sewer in Third-avenue, for Mr. R. P. Cooper. Messrs. Homer & Co., surveyors, Estate Office, Frinton-on-Sea, Essex :—

H. J. Linzell*	£189	G. Abbot	£189

FRINTON-ON-SEA.—For alterations to house and stables, for Mr. R. P. Cooper. Messrs. Homer & Co., architects and surveyors, Estate Office, Frinton-on-Sea, Essex :—

H. J. Linzell	£247	F. B. Pitcher	—
G. Abbot*	196		

GATESHEAD. — For rebuilding the "Foresters' Arms" inn, Askew-road, for Mr. R. Newton. Mr. A. G. Kyle, architect, 145, Pilgrim-street, Newcastle. Quantities by architect :—

J. Ross	£2,650 16 0	T. & R. Lamb	£2,327 13 2
H. & A. Arkless	2,407 2 0	J. Bewley	2,253 0 0
J. C. Nichol	2,380 0 0	Turner Bros.	2,159 5 9
J. Wales & Co.	2,350 0 0	Thompson	2,118 0 0

GREAT YARMOUTH.—For additions to Northgate School, for the School Board. Messrs. Bottle & Olley, architects, Queen-street, Great Yarmouth. Quantities by the architects :—

G. W. Beech	£2,255	J. S. Read	£1,887
J. Rand	2,210	J. Moore	1,878
A. E. Bond	2,150	J. Ward, North Quay*	1,870
F. Grimble	1,905		
Carter & Wright	1,903		

Plumbing.

R. A. Eastoe	£143 17
R. H. Tooley, North Quay*	116 0

GUILDFORD.—For the execution of road works, Foxenden Estate, for the Corporation. Mr. C. J. Mason, Borough Surveyor, Tuns Gate, Guildford :—

	York-road. Section 1.	York-road. Section 2.	Victoria-road.	Foxenden-road.	Springfield-road.	Falcon-road.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
W. Norris, Hale, Farnham	620 0 0	156 0 0	172 0 0*	235 0 0*	312 0 0*	165 0 0
W. H. Wheeler, London	937 7 10	249 9 9	—	—	—	—
G. A. Franks, Guildford	611 15 1*	149 5 11*	192 18 5	262 7 5	342 2 9	150 9 9
Streeter, Godalming	627 7 6	166 13 4	182 5 6	244 17 10	326 2 9	135 15 2*

HALTWHISTLE.—For the erection of a dwelling-house, for Mr. R. Hastewell. Mr. H. Higginson, architect, Carlisle. Quantities by the architect :—

Builder's Work.—Coulson & Jackson*
Slating.—Coulson & Jackson*.....
Joinery.—Wm. Johnson* ..... } £1,794
Plumbing.—Clark & Kitchen*.....
Plastering.—A. Scudamore*.....
Painting and Glazing.—R. P. Kirk, Carlisle* .....

[All of Haltwhistle.]

HORSHAM.—For additions to "Queen's Head" hotel, for Messrs. King & Sons, Limited. Mr. C. H. Burstow, architect, 6, West-street, Horsham :—

Potter Bros.	£340	G. Potter, Horsham*	£320
Rowland Bros.	335		

ILFORD (Essex).—For stabling, with harness-room and fodder lofts, stores and manager's residence with office, for Messrs. Thorne Bros., brewers, Nine Elms, London. Messrs. Douglas Young & Co., architects, 51, Coleman-street, E.C. Quantities supplied :—

	Stables paved with Blue Staffordshire Paving.	Add. if Stables paved with Adamantine Clinkers.
Dowsing & Davis	£2,555 0	£105 0
F. Wilmott	2,490 0	97 0
Turtle & Appleton	2,360 0	35 0
W. H. Cole	2,236 0	16 0
H. Pridmore	2,210 0	13 0
F. R. Blaxton	2,207 7	34 9
Golder & Gregory	2,207 0	11 0

KIRKBY-IN-ASHFIELD.—For the erection of schools, for the School Board. Mr. Lawrence Bright, architect, 9, St. Peter's Church-walk, Nottingham. Quantities by architect :—

Wm. Bains	£5,070	Wm. Maule	£4,935
G. Caulton	4,980	T. Cuthbert	4,927
H. Vickers	4,970	H. Gilbert	4,860
T. Barlow	4,950	J. Oscroft, Nottingham*	4,730

LEAMINGTON.—For the erection of residence at Leamington, for Mr. F. M. Spencer. Mr. R. A. Briggs, architect, Norfolk-street, Strand. Quantities by Mr. J. Gandy :—

Bromage & Evans	£6,223 13	Smith & Son	£4,636 0
J. S. Kimberley	5,353 0	C. H. Barber, Coventry*	4,599 0
Parnell & Son	4,767 0		

LONDON.—For the erection of engine-house and chimney-shaft at Northern Hospital, for the Metropolitan Asylums Board. Messrs. Pennington & Son, architects :—

Cross & Co.	£3,470 7 4
Merredew & Wort	3,312 0 0
Wall & Co.	3,289 0 0
Chessum & Sons	3,266 0 0
General Builders, Ltd.	3,130 0 0
J. Appleby, Cornwall-road, S.E.*	2,795 0 0

* Accepted with variations at £2,620.
[Architects' estimate, £1,700.]

LONDON.—For alterations and additions to the "King of Prussia," Broadway, Stratford. Mr. J. M. H. Gladwell, architect :—

J. & H. Cocks	£915	Welsh & Sons	£743
W. J. Maddison	825	W. M. Norton*	699
A. E. Symmes	809		

LONDON.—For painting, &c., at St. George's Schools, Upton Park :—

Tebbutt & Co.	£1,100	Heard & Co.	£657 0
Bamber	895	Wall & Co.	650 0
J. Horswill	849	Richards	637 0
H. C. Horswill	835	Vigor & Co.	615 10
Mills	815	J. Gibbs*	578 18
Kybett	800	Hoe	550 0
Woollaston Bros.	715	H. Brady	539 0

LONDON.—For the erection of a boys' school in Westbere-road, West Hampstead, for the Managers of Aske's Haberdashers' Schools. Mr. Henry Stock, architect. Quantities by Messrs. Widnell & Trollope :—

Balaam Bros.	£30,979	Akers & Co.	£28,073
F. & H. F. Higgs	30,660	Turtle & Appleton	28,000
B. E. Nightingale	29,745	Rudd & Son	28,000
Higgs & Hill, Ltd.	29,200	Patman & Fotheringham	27,591
Smith & Co.	28,900	Hockley & Son	27,449
J. Perkins	28,850	Chessum & Sons	26,990
Willcock & Co.	28,411	Kirk & Randall	26,944
Godson & Son	28,363	Gough & Co.*	25,861
Bowers & Co.	28,221		
Gregory & Co.	28,187		

LONDON.—For sundry alterations, No. 412, Mile End-road, for Mr. Joseph :—

Todd & Co.	£437	Heard & Co.	£349
Blow	386		

LONDON.—For the erection of factory at Upper Holloway :—

Heard & Co. £2,126

[No competition.]

LONDON.—For repairs to Brockhurst, Woodside Park, North Finchley, for Lieut.-Col. Brooke. Mr. Percy L. Marks, architect :—

Preliminary Works (1898).

F. Dowdall	£103 0	Mansfield & Son	£85 0
Grover & Son	91 0	Callow & Wright*	68 18

Second Specification (1899).

Callow & Wright	£365 0	A. V. Paddison†	£326 10
Grover & Son	338 10		

† Accepted subject to arrangement.

Goods supplied to builder (1899) £71 8 3

LONDON.—For new premises at Royal Wharf, Townmeed-road, Fulham, for Messrs. Goldman, Phillips, & Jay. Mr. George Ashby Lean, architect, Palace Chambers, Westminster :—

Patman & Fotheringham	£3,976	Howell J. Williams	£3,548
Wall & Co.	3,950	F. Jenkins	3,540
Adamson & Sons	3,579	L. H. R. Roberts	3,489

LONDON.—For repairing and redecorating No. 46, Grosvenor-street, W. :—

H. & E. Lea	£970	W. H. T. Kelland	£698
G. H. Rowe	915	R. S. Buckeridge	655
Edwards & Medway	730		

MANSFIELD.—For additions to the Forest Hospital, Southwell-road. Mr. R. Frank Vallance, Borough Surveyor, Mansfield :—

J. Greenwood	£540 0 0	C. G. Percival	£416 14 6
S. B. Frisby	486 0 0	J. Ashley, Mansfield, Woodhouse*	414 0 0
Fisher Bros.	470 0 0		
Vallance & Blythe	442 10 6		

NEWARK.—For the supply of granite (1,050 tons) and slag (850 tons), for the Rural District Council. Mr. R. Oakden, jun., Surveyor, Kirkgate, Newark :—

	Per ton at Newark stations. s. d.
Mountsorrel Granite Co., Leicestershire, 770 tons XX granite	8 9
280 tons X granite	8 3
Wm. Prestwich, Dronfield, Sheffield, 680 tons slag	4 10 at Clifton station.
Carr & Co., Dronfield, Sheffield, 170 tons slag	4 7

NORWICH.—For erecting a residence, Newmarket-road, Norwich, for Mr. E. D. Adcock. Mr. A. F. Scott, architect, Norwich :—

T. H. Yelf	£1,765	W. S. Dawes	£1,625
R. W. Wilkin	1,665	T. Gill	1,594
Tyrrell Bros.	1,650	J. Hurn	1,574
Youngs & Son	1,640	J. Evans*	1,561
Scarles Bros.	1,626		

[All of Norwich.]

NORWICH.—For erecting a house and shop, Magdalen-street, Norwich, for Mrs. H. S. Woodcock. Mr. A. F. Scott, architect, Norwich :—

Downing & Son	£1,197	Scarles Bros.	£1,037
J. S. Smith	1,057	Youngs & Son	1,028
T. H. Yelf	1,050	W. S. Daws*	1,018

[All of Norwich.]

RAWTENSTALL (Lancs.).—For the execution of street works, Dean-lane, for the Corporation. Mr. A. W. Lawson, C.E., Municipal Offices, Rawtenstall :—

John Moore	£1,791 7	P. D. & S. D. Hayes, Stockport*	£1,681 10

RAWTENSTALL (Lancs.).—For the construction of pipe sewer, manholes, &c., for the Corporation. Mr. A. W. Lawson, C.E., Borough Surveyor, Municipal Buildings, Rawtenstall :—

Wm. Jenkins	£3,436 0 0	H. N. Davison	£2,832 18 9
Thomas Turner	3,224 3 11	John Moore	2,826 10 7
Enoch Tempest	3,054 4 8	P. D. & S. D. Hayes, Stockport*	£2,671 15 2
J. & J. Lee	2,992 0 7		
Etheridge & Clarke	2,889 3 0		

SHOEBURYNESS.—For making-up St. Andrew's-road and West-road, for the Urban District Council. Mr. Harold Harris, surveyor, Clarence-street, Southend-on-Sea :—

St. Andrew's-road.

W. Iles	£500 0 0	Harris & Rowe, Lim.*	£478 6 6
Buxton & Jenner	494 5 10		

West-road.

Buxton & Jenner	£683 7 4	Harris & Rowe, Lim.*	£652 5 9
W. Iles	655 0 0		

[See also next page.

REDHILL.—For alterations and additions to premises, Brighton-road, Redhill, for Messrs. Ind Coope & Co., Limited. Messrs. Harrington & Ley, architects, 108, Fenchurch-street, E.C. :—

Nightingale & Sons, Reigate* £347

STRATFORD-ON-AVON.—For the erection of a Technical School, Henley-street, for the Committee. Mr. Arthur S. Flower, architect, 7, Gordon-place, London, W.C. Quantities by Mr. W. Thornicraft, 6, South-square, Gray's Inn, W.C. :—

R. M. Hughes	£2,241 0 0	Geo. Whateley, Stratford-on-Avon*	£1,660 0 0
Callaway Bros.	1,990 0 0		
Smith & Sons	1,800 0 0	Smallwood & Co.	1,620 0 0
Fincher & Co.	1,785 0 0		
J. Harris	1,710 11 3		
E. T. Kennard	1,663 15 0		

SUNBURY-ON-THAMES.—For the supply of Norway granite edge kerbing, for the Urban District Council. Mr. H. F. Coales, Surveyor, Council Offices, Sunbury:—

	per ft. run. s. d.
Mowlem & Co.	2 0
A. & F. Manuelle	1 8
Van Praagh & Co.	1 7½
Blichfeldt & Co., Water-lane, Great Tower-street*	1 7

TREORKY (Wales).—For the erection of a Baptist Chapel, for the Baptist Denomination. Mr. J. Roderick, architect, Blaencwm, Treherbert, Glam. :—

T. W. Davies	£2,055 0	Matthias J. Edwards, Treorky*	£1,800 0
John Rees	2,045 0		
Jonathan Jones	1,897 19		

WARWICK.—For the erection of supply stores, Market-place, for Messrs. Walker. Mr. F. P. Trepess, architect, 8, Jury-street, Warwick. Quantities by architect :—

Smith & Sons ..... £1,550 0 | Tallip, Warwick * £1,438 10

* Exclusive of fittings.

WESTON-SUPER-MARE.—For the erection of stables, coach-house, &c., for Mr. F. Blackmore. Messrs. S. J. Wilde & Fry, architects, Boulevard-chambers, Weston-super-mare. Quantities by the architects :—

Keen & Keen	£873	C. Addicott, Weston-super-Mare*	£780
C. Penny	865	G. Sprake	770
H. A. Forse	795		
W. M. Ruben	785		

WHITBY.—For the erection of parish room, St. Hilda's-terrace, Whitby, for the Rev. Canon Austen and Committee. Mr. E. H. Smales, architect, 5, Flowergate, Whitby :—

With Sureties.

Langdale & Sons	£1,590 0
R. Harland	1,548 0
John Brain, Whitby*	1,525 0

Without Sureties.

C. Winterburn	1,670 0
Fletcher & Gladstone	1,463 5

WREXHAM.—For the re-erection and extension of the Central Store premises, for Mr. W. J. Williams. Messrs. J. Morison & Son, architects, King-street, Wrexham :—

Wm. Owen	£2,900	W. E. Samuel	£2,360
H. A. Jones	2,670	Davies Bros.*	2,235

[All of Wrexham.]

WREXHAM.—For (A) the execution of street works, Ruabon and Victoria roads, and (B) Construction of surface water drains, for the Town Council. Mr. J. W. M. Smith, Borough Surveyor, Town Hall, Wrexham :—

	A	B
William Owen, Wrexham*	£432 18 6	260 8 0

WORKINGTON.—For the erection of a house, Gray-street, for Mr. A. E. Middleton. Messrs. W. G. Scott & Co., architects, Victoria-buildings, Workington :—

Building.—Robert Brown	£256 0 0
Joinery.—G. H. Chambers	138 0 0
Slating.—Lythgoe & Sons	22 10 0
Plumbing.—Hodgson & Co.	50 12 10
Plastering.—J. Lawson	55 0 0
Painting.—G. Davies	17 2 6
Heating.—Barker & Son	23 6 0

[All of Workington.]

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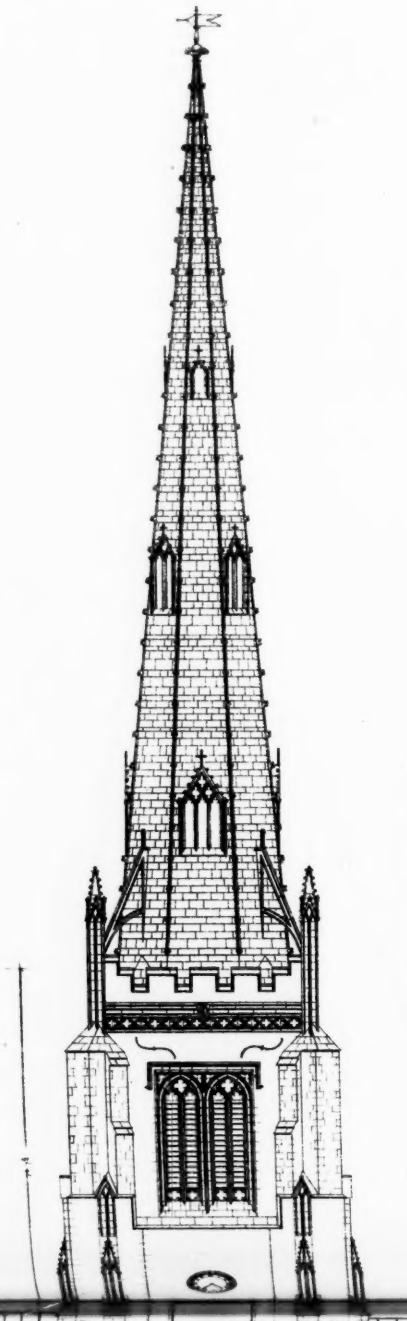

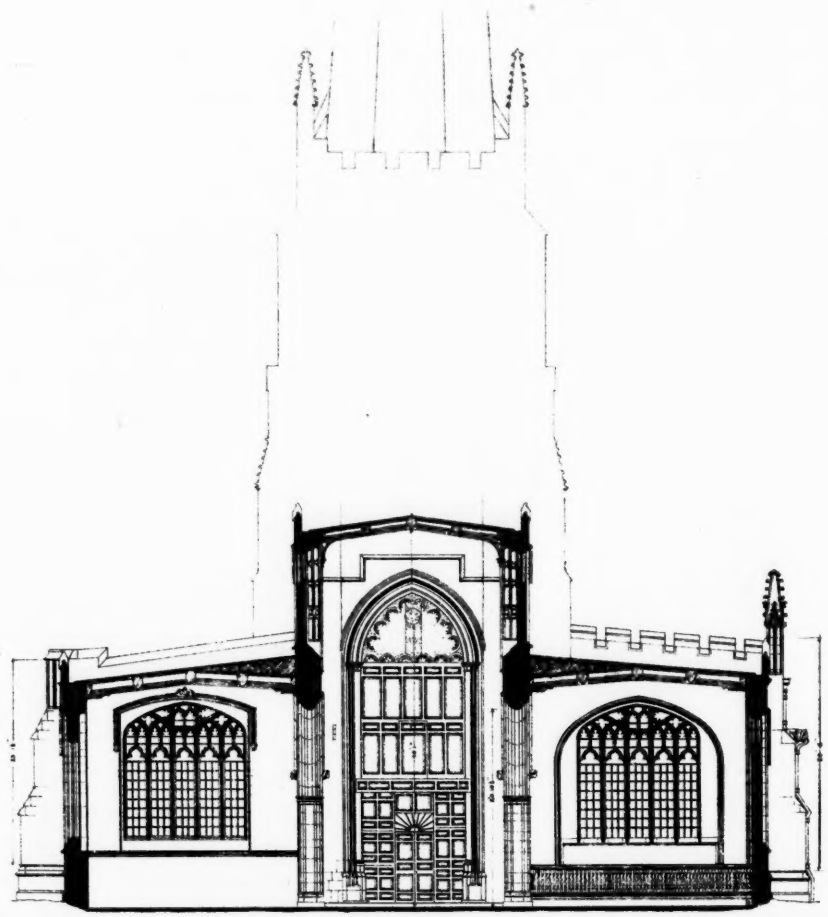

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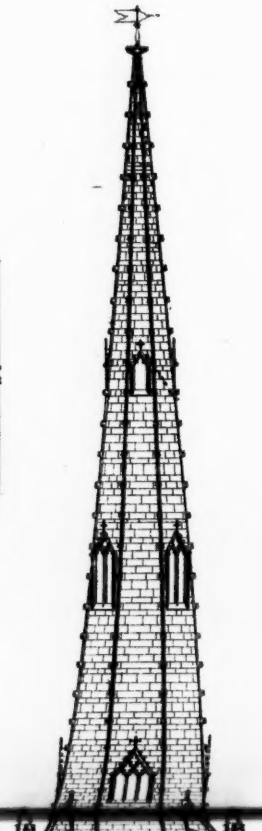

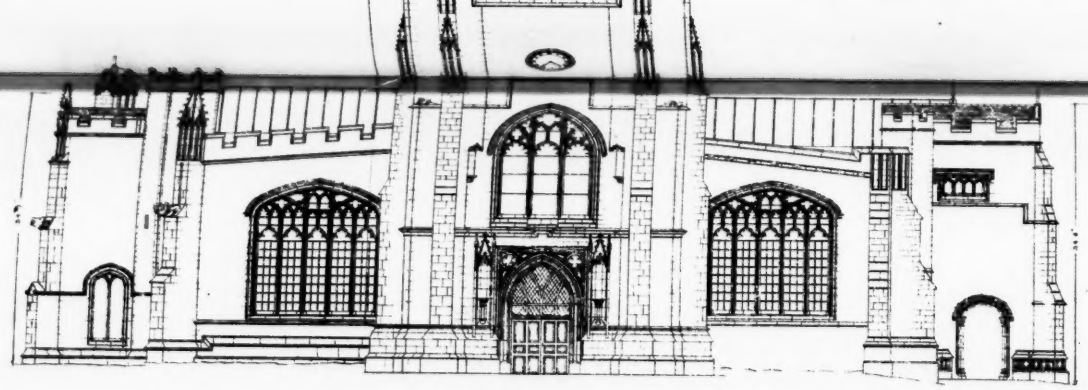

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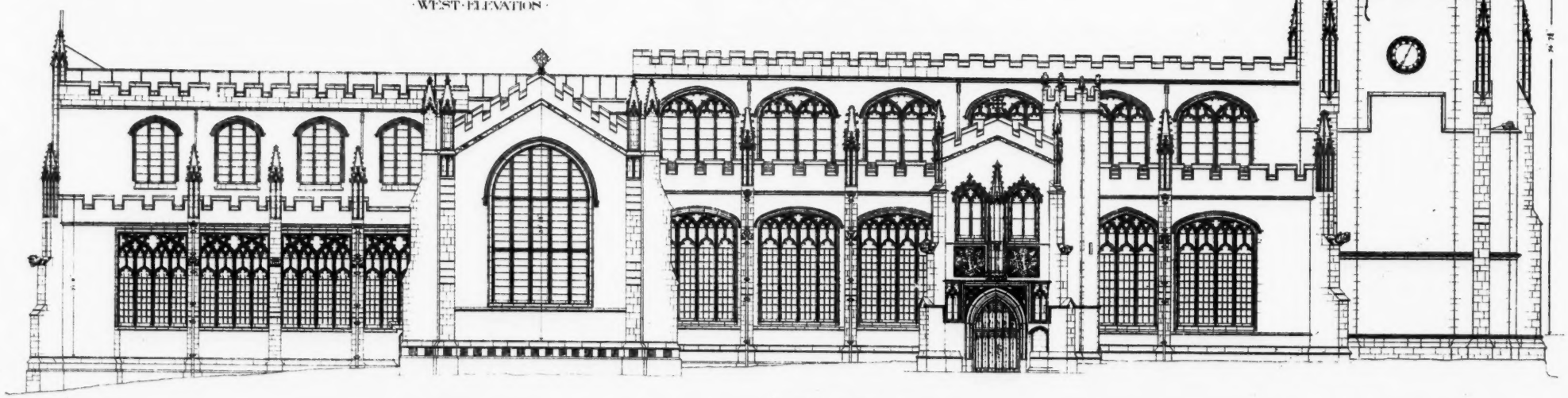

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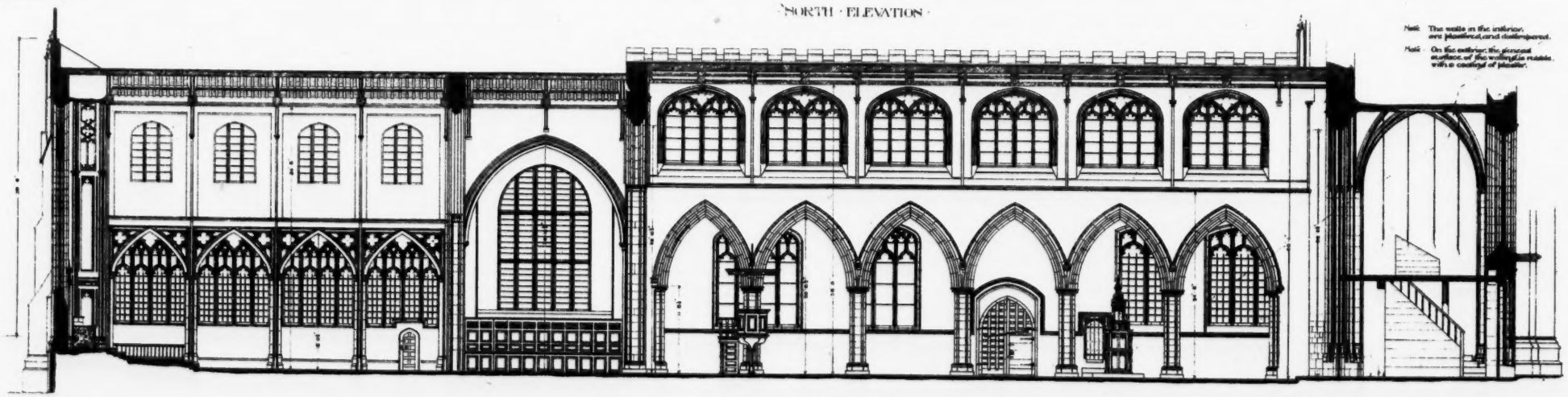

Note. The walls on the interior are plastered and distempered.

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LONG · SECTION ·

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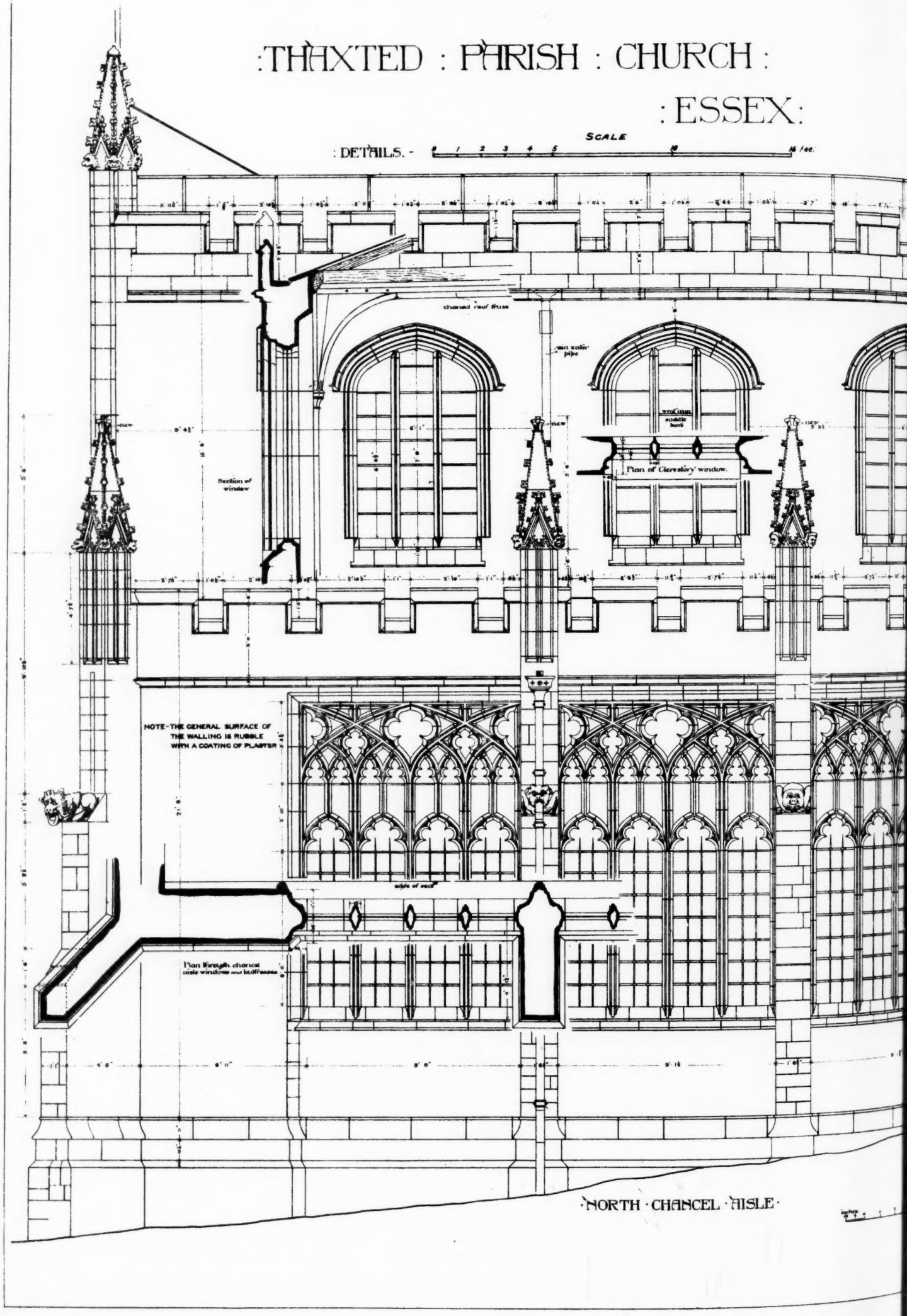
Section of window
Plan of Clerestory window.
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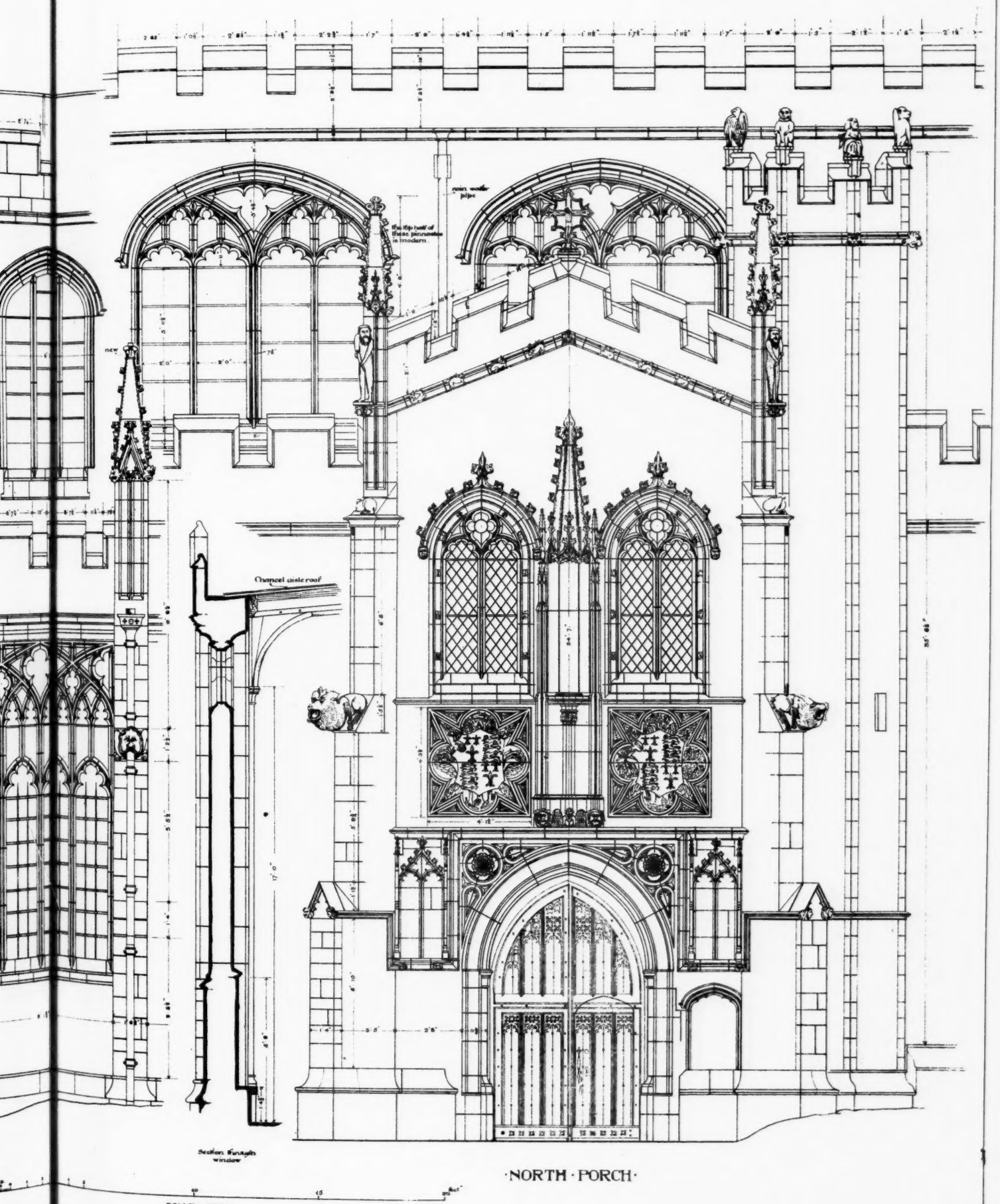

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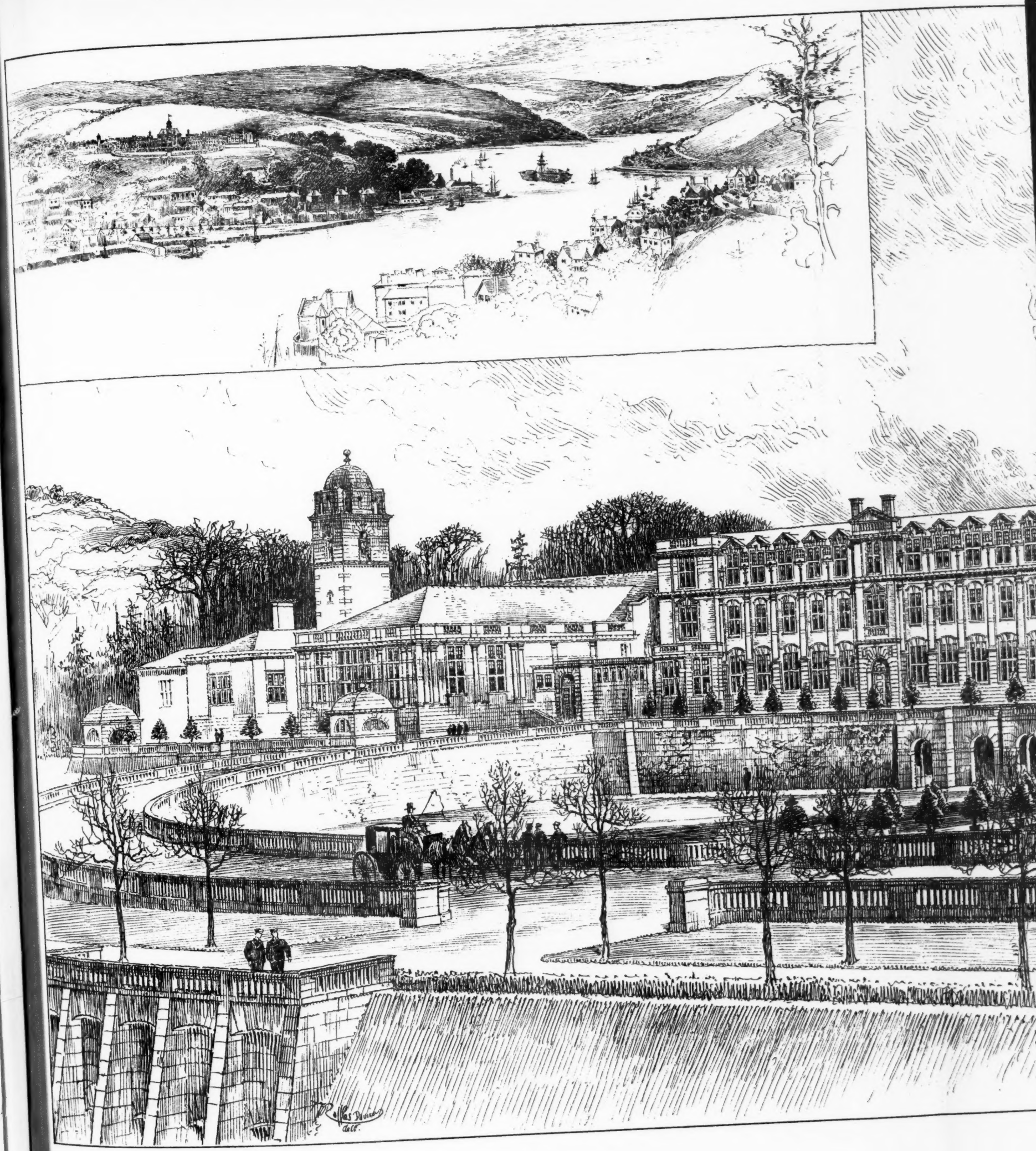

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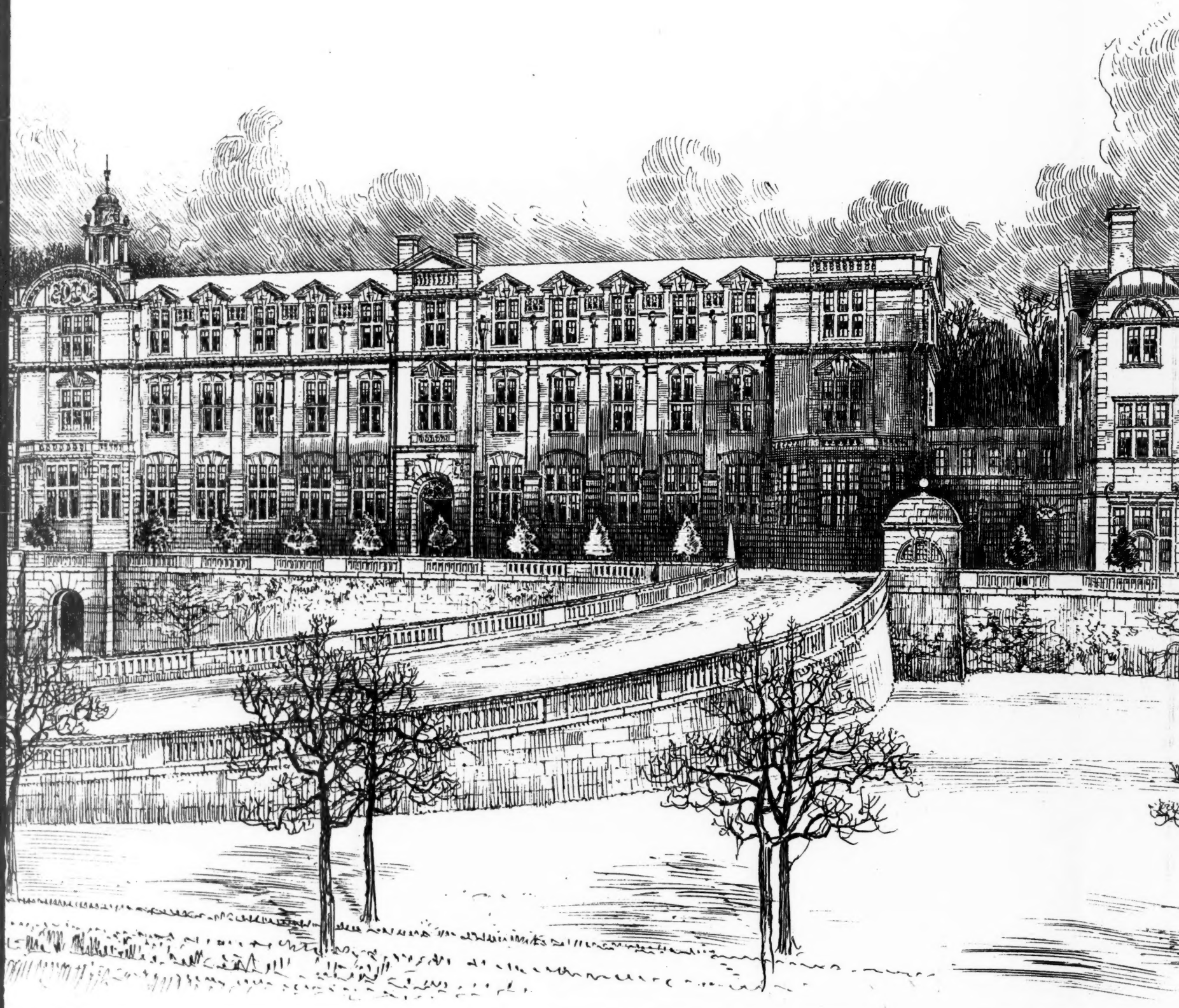

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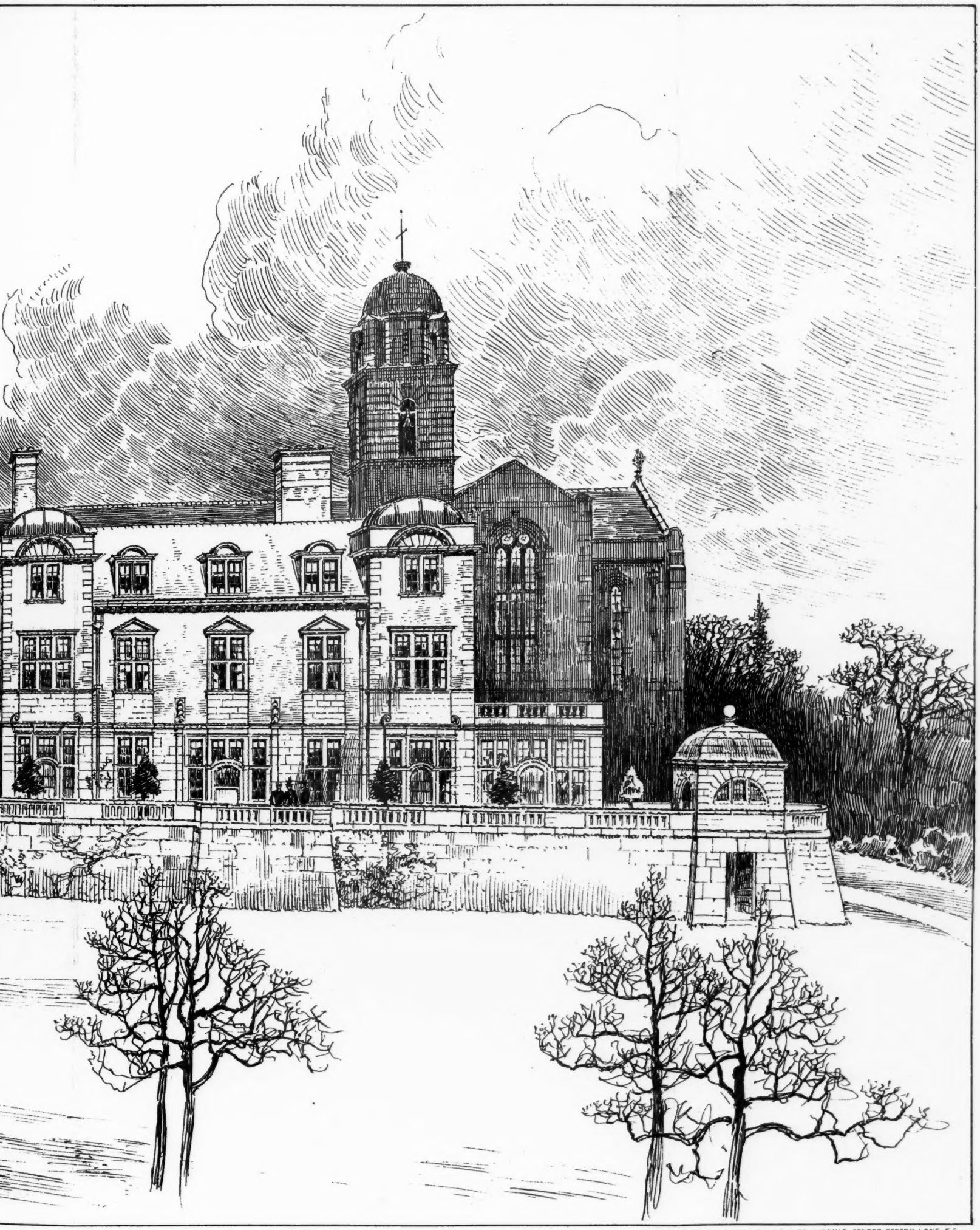

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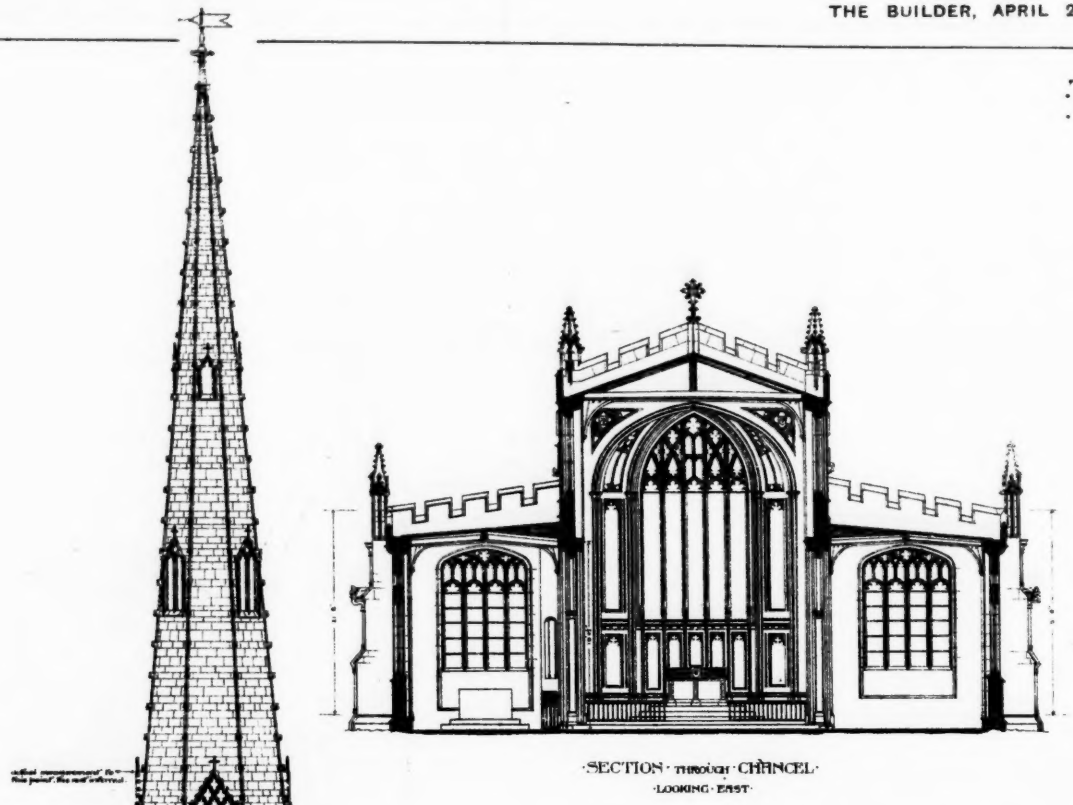

·SECTION· through ·CHANCEL·
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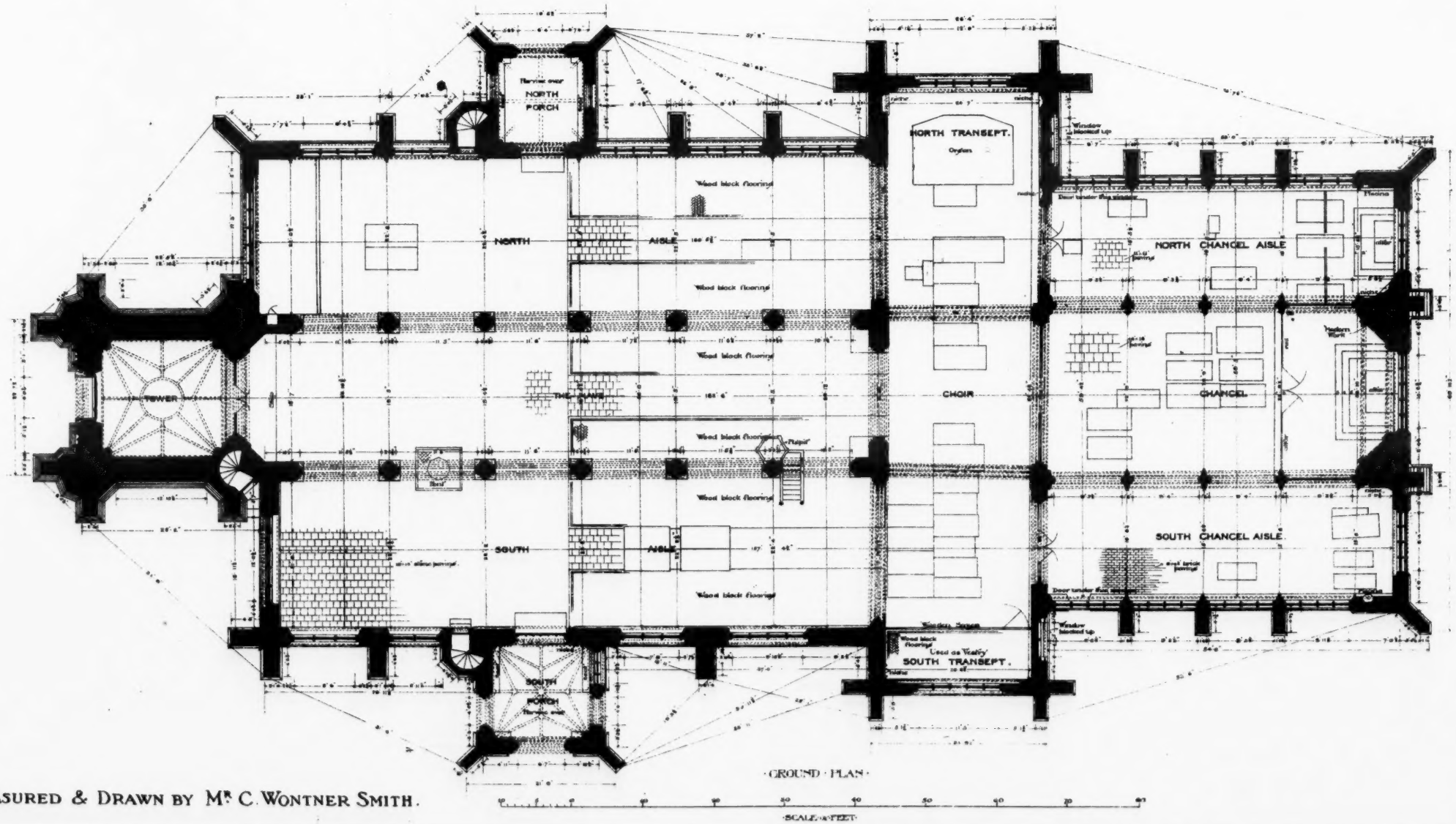

·GROUND·PLAN·

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